ACER FP-553

MODEL

SERVICE MANUAL

Table of Contents

1. Introduction 4
2. Operational Specification 4
2.1 Environment 4
2.1.1 Temperature 4
2.1.2 Humidity 4
2.1.3 Altitude 4
2.2 Transportation 5
2.2.1 Vibration Test (Package, Non-Operating) 5
2.2.2 Drop Test (Package, Non-Operating) 5
2.2.3 Vibration Test (Unpackage, Non-Operating) 6
2.2.4 HALF-SINE SHOCK 6
2.3 Packing Configuration 7
2.3.1 Container Specification 7
2.3.2 Carton Specification 8
2.3.3 Pallet Specification 8
2.3.4 Container Carrying Capacity 9
2.4 Electrostatic Discharge Requirements 13
2.5 Safety Requirements 13
2.6 EMI Requirements 14
2.7 Reliability 14
2.8 Mechanical Design for TCO 99: 14
2.9 Environment Protection Design : 15
3. Input / Output Signal Specification 15
3.1 Input Signal Requirements 15
3.1.1 Signal cable (Directly attached to unit) 15
3.1.2 Video signals: 15
3.1.3 Sync signal: 15
3.2 Function 15
3.2.1 Support timing 16
3.3 Number of display colors: 16M color numbers (With Dithering) 17
3.4 Adjustment function 17
3.5 Display Power Management System (DPMS) 17
3.6 Plug & Play DDC1/2B Support 17
3.7 Power Supply Requirements 21

FP553 LCD Monitor Service Guide

Chapter 1 Engineering Specification (X2)

Table of Contents

3.7.1 Input Power Requirements 21
3.7.2 Output Power Requirements 22
3.7.3 AC Power Inlet 22
3.7.4 Power Management 22
3.8 Panel optical Characteristics 23
3.9 BACK-LIGHT UNIT 25
4. Functional specification 27
4.1 Display Quality 27
4.1.1 Display Data Area (with full white pattern) 27
4.1.2 Video Performance 27
4.1.3 Light Output 27
4.1.4 Brightness Adjustment Range 27
5. Physical Specifications 27
5.1 Physical Dimension & Appearance 27
5.1.1 Overall Dimensions: 27
5.1.2 Outer Appearance: 27
5.2 Construction and Materials on outer surface 27
5.3 Base 28
5.4 Marking & Labels 28
5.4.1 Reference Label (Rear panel) 28
5.4.2 Controls & Connectors 28
5.5 Packaging 28
5.5.1 Carton Dimension: 28
5.5.2 Shipping Weight: 28
5.5.3 Shipping Container: 28
6. Maintainability Specifications 28
6.1 General & Requirements 28
6.1.1 Installation: 28
6.1.2 Periodic Maintenance: 28
6.1.3 Repair & Calibration: 28
6.2 Mean Time to Repair 28
6.2.1 Module Level: 28
6.2.2 Component Level: 29
6.3 Accessibility 29

Table of Contents

6.3.1 General 29
6.3.2 Outside Cabinet, access to the following elements 29
6.3.3 Cover Removal, Access 29
6.4 Equipment & Tools Required 29
6.4.1 Standard Test Equipment 29
6.4.2 Documentation 29
6.5 Electrical Emission and Energy Saving summary for TC099 29
6.5.1 Electrical Field(AC): 29
6.5.2 Magnetic Field(AC): 29
6.5.3 Energy Saving: 29

FP553 LCD Monitor Service Guide

Chapter 1 Engineering Specification (X2)

1. Introduction

This specification describes a 15.0" color TFT LCD monitor which is supported by analog interface solution and support maximum resolution 1024X768 at 75Hz refresh rate. It has the following features:

- User controls:
  (a) "Power on/off" switch.
  (b) "Exit" key (Back to main OSD menu or leave OSD menu).
  (c) "I-key" (Intelligent key for automatic adjustment function by pressing one button).
  (d) "Enter" key (for enter OSD sub-menu or select items.
  (e) "Inc" key (for increase value for adjust or select OSD function).
  (f) "Dec" key (for decrease value for adjust or select OSD function).
- OSD window for control and information display with 6 languages selection.
- DPMS (Display Power Management System)
- Power on/off indicator.
- High quality advanced zoom function (Scaling function)
- Tilt base (with tilt function from 0 to +25 degree).
- DDC1/2B function supported.

It is composed of the following materials:

- A LCD monitor
  (a) Head part:
  (1)A LCD module (ADTL150X2M-1).
  (2)An Inverter and AC-DC board
  (3)An Interface board.
  (4)A control board.
  (5)A 15pin D-sub signal cable.
  (b) Base part:
  (1)Tilt base.
- A power cord.
- A user menu.
- Setup disk (Including .INF/.ICM/Test pattern).

2. Operational Specification

2.1 Environment

2.1.1 Temperature

-Operating	5 to +40 degrees Celsius
-Non-operating	-20 to +60 degrees Celsius

2.1.2 Humidity

-Operating	20 to 80% Max. non-condensing
-Non-operating	10 to 85% Max non-condensing

2.1.3 Altitude

-Operating	0 to 3,048m (10,000ft)

-Non-operating 0 to 12,192m (40,000ft)

2.2 Transportation

2.2.1 Vibration Test (Package, Non-Operating)

A) Sine-wave vibration for initial resonance sweep and dewell

* Sine sweep

Frequency (Hz)	Status
5 ~ 26.6	0.6G
26.6 ~ 50	0.016"
50 ~ 500	1.5G

Sweep times: 1 sweep / Per Axis (X,Y, and Z Axis)

* One major resonance dwell is required for each axis.
Total dwell time at each resonance point shall be 15 minutes.

B) Random Vibration

Frequency (Hz)	Slope (dB/Oct.)	Spectrum Level (g2/Hz)
5 ~ 100	0	0.015
100 ~ 200	-6	---
200	---	0.0038

Equivalent to 1.47 G rms

* Duration : 30 Minutes / Per Axis (X,Y, and Z Axis)
Total test time : 90 Minutes

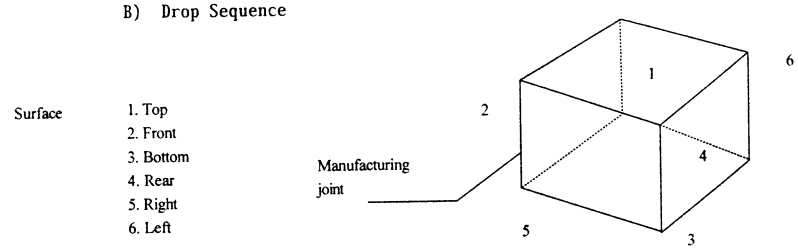
2.2.2 Drop Test (Package, Non-Operating)

A) Drop Height

[illegible] (cm)	[illegible] (cm)
0 - 9	91
> 9 - 18.2	76
> 18.2 - 27.2	61
> 27.2 - 45.4	46
> 45.4 - 68.1	31
> 68.1 - 113.5	26

Upgrade one level of height before MP.

B) Drop Sequence



-Corner 5-3-2 select at weakness side [the low left(or right) corner of the front panel]

-An edge drop with impact on the shortest edge radiating from corner 5-3-2

-An edge drop with impact on the next shortest edge radiating from corner 5-3-2

-An edge drop with impact on the longest edge radiating from corner 5-3-2

-A flat drop with impact on the rear

-A flat drop with impact on the front

-A flat drop with impact on the right

-A flat drop with impact on the left

-A flat drop with impact on the bottom

-A flat drop with impact on the top

After test, there is no electrical and mechanical damage permitted.

2.2.3 Vibration Test (Unpackaged, Non-Operating)

5~200Hz at 1.04g rms

FREQUENCY (Hz)	SPECTRUM LEVEL (g^2/Hz)
2.0	0.0185
4.0	0.0300
8.0	0.0300
40.0	0.0030
55.0	0.0100
70.0	0.0100
200.0	0.0010

- DURATION: 15 MINUTES PER AXIS.

2.2.4 HALF-SINE SHOCK

Test conditions:

Test unit : 2 sets

Each unit has to withstand 18 shocks.(3 shocks pre face)

No- operation
Half-sine wave
Duration : 3ms
Acceleration(G) : 100G

2.3 Packing Configuration

2.3.1 Container Specification

a. Shipping Container

Container Type		20'*8'*8'6" Steel	40'*8'*8'6" Steel	40'*8'*9'6" High Cube Steel
Weight(Kgs)	Gross	24,000	30,480	30,480
	Tare	2,370	4,000	4,200
	Payload	21,630	26,480	26,280
Interior Measurement (mm)	Length	5,898	12,031	12,031
	Width	2,352	2,352	2,352
	Height	2,394	2,394	2,699
Volume(Cubic Meter)		33.2	67.74	76.4
Door opening(mm)	Width	2,340	2,340	2,340
	Height	2,280	2,280	2,585
Useable Interior Dimension (Deducted pallet 130mm & Operating spec 50mm)	Length	5,890	12,000	12,000
	Width	2,330	2,330	2,330
	Height	2,100	2,100	2,405

b. Air Transport

Container Type	Container (1)	Container (2)	Container (3)
	125"*96"*96"	125"*96"*118"	125"*88"*64"

Container Type		Container (1)	Container (2)	Container (3)
Weight(Kgs)	Gross	6,804	6,804	4,627
	Tare	129	129	129
	Payload	6,675	6,675	4,498
Interior Measurement (mm)	Length	3,048	3,048	3,048
	Width	2,260	2,260	2,082
	Height	2,438	2,997	1,625
Volume(Cubic Meter)		17	19	11

2.3.2 Carton Specification

Product Weight(Kgs)	Net	4.63
	Gross	6.63
Carton Interior Measurement(mm)	Length	440
	Width	426
	Height	141
Carton External Measurement(mm)	Length	460
	Width	446
	Height	173

2.3.3 Pallet Specification

a. Dimension

Transport Type		Pallet A	Pallet B	Pallet C	Pallet D
Shipping Pallet Dimension(mm)	Length	902	1348	902	1348
	Width	950	950	480	480
	Height	115	115	115	115
Air Transport Pallet Dimension(mm)	Length	902	1348	X	X
	Width	950	950	X	X

Transport Type		Pallet A	Pallet B	Pallet C	Pallet D
	Height	115	115	X	X

2.3.4 Container Carrying Capacity

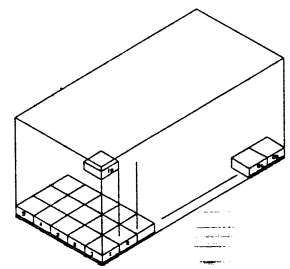
a, Shipping Container

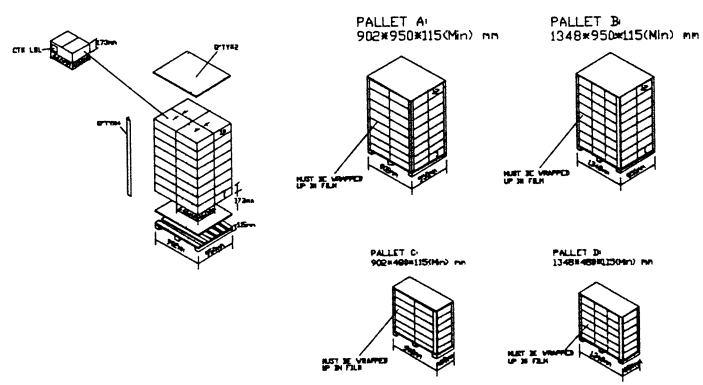
Stowing Type		Quantity of products (sets) (Every container)	Quantity of Products (sets) (Every Pallet)	Quantity of pallet (sets) (Every Container)
with pallet	20'	720	Pallet A: 4	Pallet A:6
			Pallet B: 6	Pallet B:6
	40'	1500	Pallet A: 4 C: 2	Pallet A:12 C:2
			Pallet B: 6 D: 3	Pallet B:12 D:2
without pallet	20'	780	X	X
			X	X
	40'	1625	X	X
			X	X

b. Shipping Container Stowing Method

40' CONTAINER LOADING (WITH PALLET)

(24X5X12)+(1X5X12)=1500 (SETS)

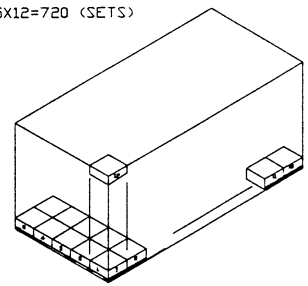




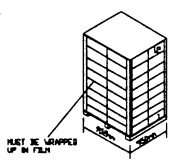
*** PALLET C/D 需請工廠改用人工堆疊,且高度限制為6層
(此乃為避免在搬運時傾倒之故); 進貨櫃為2層棧板相堆疊

20' CONTAINER LOADING (WITH PALLET)

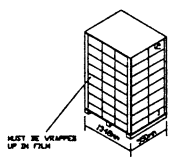
12X5X12=720 (SETS)

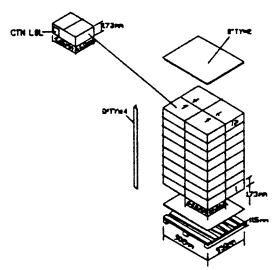


PALLET A:
902*950*115(Min) mm



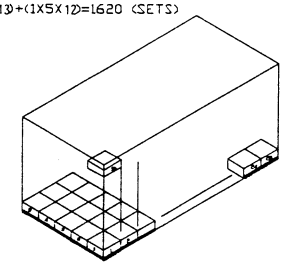
PALLET B:
1348*950*115(Min) mm

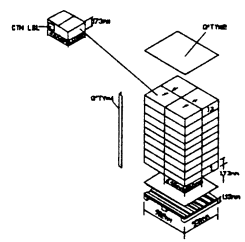




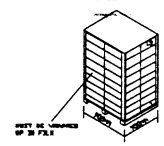
40' HIGH-CONTAINER LOADING (WITH PALLET)

(24X5X13)+(1X5X12)=1620 (SETS)

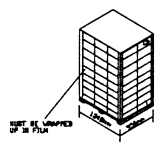




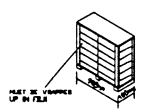
PALLET A:
902*950*115(Min) mm



PALLET B:
1348*950*115(Min) mm



PALLET C:
902*498*115(Min) mm

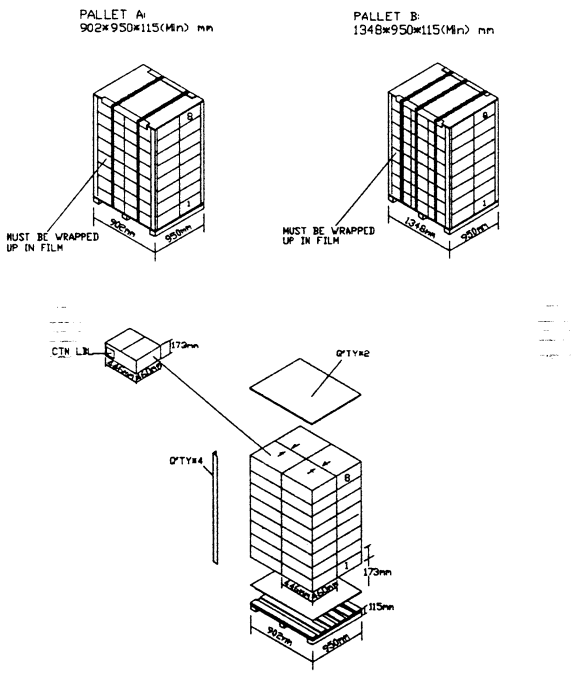


PALLET D
1348*498*115(Min) mm

*** PALLET C/D 需請工廠改用人工堆疊,且高度限制為6層
(此乃為避免在搬運時傾倒之故); 進貨櫃為2層棧板相堆疊

C. Air Transport Container Stowing Method

CONTAINER LOADING BY AIR(WITH PALLET)



2.4 Electrostatic Discharge Requirements

The subject product must withstand 4 KV for contact discharge and 8 KV for air discharge of Electrostatic Discharge and meet the acceptance criteria as specified in XXXISO 9241-3XXX -- should be IEC 801-2 .

2.5 Safety Requirements

The display unit complies with the following safety standards and specifications.

-UL compliance....standard for information-processing and business equipment, UL 1950.
-CSA compliance...standard C22.2 No. 950-M89, data processing equipment.
-TUV compliance...EN60950 safety specification-business equipment.
-ISO13406-2 .Ergonomic Requirements of Visual Display.

-Demko...EN60950.
-Nemko...EN60950.
-Semko...EN60950.
-Fimko...EN60950.

2.6 EMI Requirements

1. This display unit complies with the following EMC rules and regulations.

   -FCC compliance...FCC Rule, Part 15, Subpart B, Class B.
   -VCCI compliance...VCCI Rule, Class-2.
   -CE Mark Compliance... 89/336/EEC.
   EN55024, EN61000-4-2/-3/-4/-5/-6/-8/-11
   EN55022, Class B.
   EN61000-3-2,EN61000-3-3.
   -DNSF compliance...EN55022, Class B.
   -MPR2 compliance
   -TCO99(option)

2. The sample for EMI agency approval should be under 3 dB of the limit.
   The production pilot run units should be under 3 dB of the limit.
   The mass production units should be under 1 dB of the limit.

2.7 Reliability

1. The prediction MTBF of display unit shall be greater than 40,000 hours excluding the lamp.(at 25 ℃)

2. Lamp lifetime: 50,000 hrs minimum at which brightness of lamp is 50% compare to that of initial value at 5.5mA and 25℃.

2.8 Mechanical Design for TCO 99:

1) Front Frame Reflectance:
   * diffuse reflectance: > 20%
   * Gloss <= 30% gloss unit

2) Labeling of plastics:

Plastic weight > 25g shall be marked in accordance with ISO11469

3) Variety of Plastic:

All plastic components that weight > 100g shall be made from the same type of plastic.

4) Painting of Plastic:

* Any plastic components that weight >100g shall not be painted lacquer or vanished. so that the paint. lacquer or vanish in dry matter exceed 1 weight-% of the plastic component.
* Mould decoration (IMD) is not allowed
* All paints. lacquers. vanishes or color additives used shall be declared by the type and mount.

5) Metallization of Plastic Housing:

* Metallization is not allowed.

6) Plastic components > 25g shall not contain retardants of organically bound chloride or bromide.

2.9 Environment Protection Design :

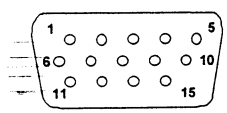
Product is Per ES 715-c49 Environment Design Guide

3. Input / Output **Signal** Specification

3.1 Input Signal Requirements

3.1.1 Signal cable (Directly attached to unit)

3.1.1.1 Video Inputs:
15pin D-sub connector is on the captive signal cable for IBM VGA, compatible graphic adapters.
The pin assignment of this connector is described as below:



* 15pin D-sub female

1 RED VIDEO
2 GREEN VIDEO
3 BLUE VIDEO
4 GROUND
5 GROUND
6 RED GROUND
7 GREEN GROUND
8 BLUE GROUND
9 PC5V
10 SYNC GROUND
11 GROUND
12 SDA
13 H SYNC (H+V)
14 V SYNC
15 SCL

3.1.1.2 Cable length:
1500mm +/- 20mm

3.1.2 Video signals:

RGB separate, Analog 0.7Vp-p/75 Ohm

3.1.3 Sync signal:

- H/V separate , TTL level
- H/V composite ,TTL level

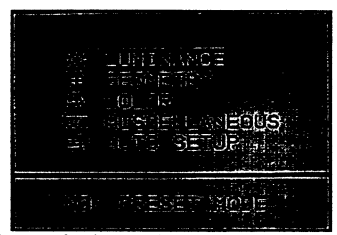
3.2 Function

3.2.1 Support timing

This Interface board is designed to operate in any of the following video mode.

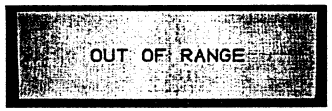
Incoming display mode(Input timing)					Actual display resolution
Resolution	Horizontal Frequency(KHz)	Vertical Frequency (Hz)	Dot Clock Frequency (MHz)	Remark	
** 640x350	31.47(P)	70.08(N)	25.175	DOS	1024X675
** 720x400	31.47(N)	70.08(P)	28.32	DOS	full screen 1024X768
** 640x480	31.47(N)	59.94(N)	25.175	DOS	
** 640X480	37.86(N)	72.80(N)	31.5	VESA	
** 640X480	37.50(N)	75.00(N)	31.5	VESA	
** 800x600	35.16(P)	56.25(P)	36.00	VESA	
** 800x600	37.88(P)	60.31(P)	40.00	VESA	
** 800x600	48.08(P)	72.19(P)	50.00	VESA	
** 800X600	46.87(P)	75.00(P)	49.5	VESA	
**1024x768	48.36(N)	60.00(N)	65.00	VESA	
**1024x768	56.48(N)	70.07(N)	75.00	VESA	
**1024x768	60.02(P)	75.03(P)	78.75	VESA	

Notes (1) The timings with "**"symbol will not be adjusted in the factory, but there will be still the default settings(rough data) for these timings.
(2) If the incoming display mode is not supported by this I/F board listed above, the up side of OSD window will show "Non Preset Mode" as below to indicate it. Maybe the picture can show up or doesn't which is unpredictable, even the picture can display but probably isn't good or clear.



(3) Some signals from graphics board may not function properly.
(4) "P", "N" stands for "Positive", "Negative" polarity of incoming HSYNC/VSYNC(input timing).
(5) OSD will show "No Signal" message on the screen as below to indicate it while no display mode inputs.
(6) OSD will show "Out of Range" message on the screen as below to indicate it while input display mode meet the following condition.

(a)The resolution is larger than 1024x768.
(b)The resolution is 1024x768 but its frequency of vertical sync(Fv) is larger than 77Hz.
(c)The frequency of horizontal sync(Fh) is larger than 65KHz.
(d)The frequency of vertical sync(Fv) is larger than 85Hz.



3.3 Number of display colors: 16M color numbers (With Dithering)

3.4 Adjustment function

Brightness
Contrast
Display position (Vertical , Horizontal)
Phase
Pixel clock
Color gain(Red, Green, Blue)
OSD position
Multi-language selection
Information
OSD time
Sharpness
Recall function

3.5 Display Power Management System (DPMS)

This Interface board will automatically cut down the power of the monitor when not receiving HSYNC or VSYNC signals over about 5 seconds, and the condition are as below,

HSYNC	VSYNC	LCD Module	Backlight
pulse	Pulse	on	on
no pulse	pulse	off	off
pulse	no pulse	off	off
no pulse	no pulse	off	off

3.6 Plug & Play DDC1/2B Support

When the DDC function is supported, it is necessary to input all EDID data(128 bytes) by using SCL and SDA signal.

These signals are directly connected to Microcontroller then by pass to 24C04 in the Interface board. It is recommended to check the specification of MCU(Myson).

EDID Table

Address (Hex)	Data (Hex)	Description
00	00	Header
01	FF	
02	FF	
03	FF	
04	FF	
05	FF	
06	FF	
07	00	
08	06	ID Manufacturer Name = API
09	09	
0A	1F	ID Product Code =FP553
0B	76	(Vender Assigned code)
0C	01	ID Serial Number
0D	01	32 bits serial no.
0E	01	(use 0 if n/a)
0F	01	
10	*	Week of Manufacture (0-53),use 0 if n/a (Varies)
11	*	Year of Manufacture (year – 1990) (Varies)
12	01	EDID version = 1
13	03	Revision = 3
14	68	Video Input Define = Analog Signal Level, separate supported
15	1F	Max. H. Image Size (cm) = 30.72 cm(=31cm)
16	17	Max. V. Image Size (cm) = 22.81 cm(=23cm)
17	78	(gamma*100) – 100 = (2.2 * 100) – 100 =120
18	EA	DPMS = Standby, Suspend, Active Off, Preferred Timing Mode
19	06	Red Green Bits Rx1Rx0Rxy1Ry0Gx1Gx0Gy1Gy0
1A	30	Blue White Bits Bx1Bx0By1By0Wx1Wx0Wy1Wy0
1B	A2	Red x bit9-2 (Red_x = 0.633)
1C	56	Red y bit9-2 (Red_y = 0.336)
1D	4B	Green x bit9-2 (Green _x = 0.294)
1E	9A	Green y bits9-2 (Green_y = 0.604)
1F	25	Blue x bit9-2 (Blue_x = 0.145)
20	18	Blue y bit9-2 (Blue_y = 0.097)
21	50	White x bit9-2 (White _x = 0.313)
22	54	White y bit9-2 (White_y = 0.329)

Address (Hex)	Data (Hex)	Description
23	AF	Established Timing I = 740x400 @ 70Hz, 640x480 @ 60Hz,640x480 @ 72Hz, 640x480 @ 75Hz, 800x600 @ 56Hz, 800x600 @ 60Hz
24	CE	Established Timing II = 800x600 @ 72Hz, 800x600 @ 75Hz, 1024x768 @ 60Hz, 1024x768 @ 70Hz, 1024x768 @ 75Hz
25	00	Established Timing III
26	01	Standard Timing Identification #1
27	01	(Unused)
28	01	Standard Timing Identification #2
29	01	(Unused)
2A	01	Standard Timing Identification #3
2B	01	(Unused)
2C	01	Standard Timing Identification #4
2D	01	(Unused)

Address (Hex)	Data (Hex)	Description
2E	01	Standard Timing Identification #5
2F	01	(Unused)
30	01	Standard Timing Identification #6
31	01	(Unused)
32	01	Standard Timing Identification #7
33	01	(Unused)
34	01	Standard Timing Identification #8
35	01	(Unused)
		Detailed Timing Description # 1 = **1024 X 768 @ 60HZ**
36	64	LSB value of "Pixel clock/10,000" (Pixel clock=65MHz)
37	19	MSB value of "Pixel clock/10,000" (Pixel clock=65MHz)
38	00	Horizontal Active(Pixels, lower 8 bits) = 1024(D) = 0400(H)
39	40	Horizontal Blanking(Pixels, lower 8 bits) = 320(D) = 0140(H)
3A	41	Horizontal Active(upper 4 bits): Horizontal Blanking(upper 4 bits)
3B	00	Vertical Active(Lines, lower 8 bits) = = 768(D) = 0300(H)
3C	26	Vertical Blanking(Lines, lower 8 bits) = 38(D) = 0026(H)
3D	30	Vertical Active(upper 4 bits): Vertical Blanking(upper 4 bits)
3E	18	H. Sync. Offset(Pixels, H. Front Porch, lower 8 bits) = 24(D) = 0018(H)
3F	88	Horizontal Sync Pulse Width(Pixels, lower 8 bits) = 136(D) = 0088(H)
40	36	Vertical Sync Offset(upper 4 bits):Vertical Sync Pulse Width(upper 4 bits)
41	00	H. Sync Offset(bit 7,6), H. Sync Pulse Width(bit 5,4), V. Sync Offset(bit 3,2), C. Sync Pulse Width(bit 1.0)
42	30	Horizontal Image Size(mm, lower 8 bits) = = 304(D) = 130(H)
43	E4	Vertical Image Size(mm, lower 8 bits) = 228(D) = 0E4(H)
44	10	Horizontal Image Size(upper 4 bits) & Vertical Image Size(upper 4 bits)
45	00	Horizontal Border(Pixels) = 0
46	00	Vertical Border(Lines) = 0
47	18	Non-interlaced, no stereo, Digital separate, H,V-Polarity=(-,-)

Address (Hex)	Data (Hex)	Description
		Detailed Timing Description # 1 = **640 X 350 @ 70Hz**
48	D5	LSB value of "Pixel clock/10,000" (Pixel clock=25.17MHz)
49	09	MSB value of "Pixel clock/10,000" (Pixel clock=25.17MHz)
4A	80	Horizontal Active(Pixels, lower 8 bits) = 640(D) = 0280(H)
4B	A0	Horizontal Blanking(Pixels, lower 8 bits) = 160(D) = 00A0(H)
4C	20	Horizontal Active(upper 4 bits): Horizontal Blanking(upper 4 bits)
4D	5E	Vertical Active(Lines, lower 8 bits) = = 350(D) = 015E(H)
4E	63	Vertical Blanking(Lines, lower 8 bits) = 99(D) = 0063(H)
4F	10	Vertical Active(upper 4 bits): Vertical Blanking(upper 4 bits)
50	10	H. Sync. Offset(Pixels, H. Front Porch, lower 8 bits) = 16(D) = 0010(H)
51	60	Horizontal Sync Pulse Width(Pixels, lower 8 bits) = 96(D) = 0060(H)
52	52	Vertical Sync Offset(upper 4 bits):Vertical Sync Pulse Width(upper 4 bits)
53	08	H. Sync Offset(bit 7,6), H. Sync Pulse Width(bit 5,4), V. Sync Offset(bit 3,2), C. Sync Pulse Width(bit 1.0)
54	30	Horizontal Image Size(mm, lower 8 bits) = = 304(D) = 130(H)
55	E4	Vertical Image Size(mm, lower 8 bits) = 228(D) = 0E4(H)
56	10	Horizontal Image Size(upper 4 bits) & Vertical Image Size(upper 4 bits)
57	00	Horizontal Border(Pixels) = 0
58	00	Vertical Border(Lines) = 0
59	1A	Non-interlaced, no stereo, Digital separate, H,V-Polarity=(+,-)
5A	00	Flag=00h when block used as descriptor

Address (Hex)	Data (Hex)	Description
5B	00	Flag=00h when block used as descriptor
5C	00	Reserved when block(address 48~59) is defined as descriptor
5D	FD	Set this block as "**Monitor Range Limits**" descriptor
5E	00	Flag=00h when block used as descriptor
5F	38	Min. Vertical rate(Hz) = 56(Hz)
60	4B	Max. Vertical rate(Hz) = 75(Hz)
61	1F	Min. Horizontal rate(kHz) = 31(kHz)
62	3C	Max. Horizontal rate(kHz) = 60(kHz)
63	08	Max. Supported Pixel Clock(MHz) = 80(MHz)
64	0A	No secondary timing formula supported
65	20	(unused)
66	20	(unused)
67	20	(unused)
68	20	(unused)
69	20	(unused)
6A	20	(unused)
6B	20	(unused)

Address (Hex)	Data (Hex)	Description
6C	00	Flag=00h when block used as descriptor
6D	00	Flag=00h when block used as descriptor
6E	00	Reserved when block(address 5A~6B) is defined as descriptor
6F	FC	Set this block as "**Monitor Name**" descriptor
70	00	Flag=00h when block used as descriptor
71	41	1st character = A
72	63	2nd character = c
73	65	3rd character = e
74	72	4th character = r
75	20	5th character = (space)
76	46	6th character = F
77	50	7th character = P
78	35	8th character = 5
79	35	9th character = 5
7A	33	10th character = 3
7B	0A	11th character =(unused)
7C	20	12th character =(unused)
7D	20	13th character =(unused)
7E	00	Extension Flag
7F	**	Checksum

3.7 Power Supply Requirements

3.7.1 Input Power Requirements

(1) Input Voltage Range
The unit shall meet all the operating requirements with an input voltage range of 90~264 Vac .

(2) Input Current
Maximum

Input Current	Measuring Range
(MAX) 2 Arms	90Vac ~ 264Vac

(3) Frequency Range
The unit shall operate within a frequency range of 47Hz to 63Hz.

(4) Inrush Current
Power supply inrush current shall be less than the ratings of its critical components(including Power switch, fuse, rectifiers and surge limiting device) for all conditions of line voltage.

(5) Regulator Efficiency
70% minimum (measuring at 115Vac and full load)

(6) Power line Transient Immunity
The power supply shall function properly after being subjected to a 8us/20us, 2000 volts(line to ground), 1.2us/50us(line to line),or 5ns/50ns,1000 volts fast peak pulse applied either differentially or single endedly to line and neutral at any phase of the power line voltage and shall not cause an unsafe or unrecoverable errors.

(7) Maximum power consumption <40 Watts
Power saving mode < 3 Watts

(8) Safety concern : 1. Earth leakage current < 3.5mA (at 264VAC)
2. Electric strength : < 10mA
Primary-Secondary : 4242 (DC)
Primary-Earth : 2121 (DC)

3.7.2 Output Power Requirements

The power circuit shall supply DC power outputs as followings:

Output	Nominal	Regulation	Load Current Range
1	12V	±10%	0 ~ 2.5A
2	4.75V	±5%	0 ~ 0.1A
3	3.3V	±5%	0 ~ 1A

3.7.3 AC Power Inlet

The display unit shall be supplied with an AC power INALWAYS 0714(or equivalent). to be located at the rear of the LCD Monitor.

3.7.4 Power Management

Mode	H/Vsync	Power consumption	LED Color (Status)	Recovery Time
Normal	Both exist	< 40W	Green (Normal)	--
Off	None or Only one exist	< 3W	Amber	5 sec

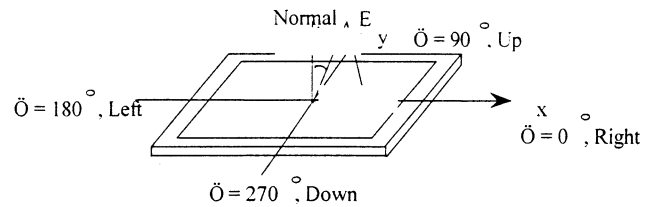
3.8 Panel optical Characteristics

Item		Condition	Symbol	Min.	Typ.	Max.	Unit
Contrast Ratio		$\psi = 0°, \theta = 0°$	CR	250	350	-	-
Viewing Angle	Vertical Up	$\psi = 0°$ (CR>=10)	θ	60	70	-	Deg.
	Down	$\psi = 0°$ (CR>=10)	θ	60	70	-	Deg.
	Horizontal Left	$\theta = 0°$ (CR>=10)	ψ	65	75	-	Deg.
	Right	$\theta = 0°$ (CR>=10)	ψ	65	75	-	Deg.
Response Time							
Rise Time	25±2.5°	Tr	-	-	8	16	ms
Fall Time	$\psi = 0°, \theta = 0°$	Tf	-	-	22	24	ms
Cross Talk	$\psi = 0°, \theta = 0°$	Tr+Tf	-	-	35	70	ms
White Luminance		Center point at CCFL 8.0mA		200	250	-	cd/m²
Brightness Uniformity				75	80	-	%
Chromaticity		White	CIE1931 $\psi = 0°, \theta = 0°$	X	0.283	0.313	0.343
				Y	0.299	0.329	0.359
		Red		X	0.58	0.61	0.64
				Y	0.31	0.34	0.37
		Green		X	0.29	0.32	0.35
				Y	0.54	0.57	0.60
		Blue		X	0.12	0.15	0.18
				Y	0.08	0.11	0.14

Note :

1. Viewing Angle, Contrast Ratio, Response Time, Reflectance, and Chromaticity are measured at panel center.
2. Viewing Angle (θ , ψ)

Measurement is done on position 1.
Viewing angle origine is the axis normal to the flat panel. Left (L) and Right (R) value are the maximum angles for which CR=10. Up (U) and (D) value are the maximum angles for which CR=10.
See figure below



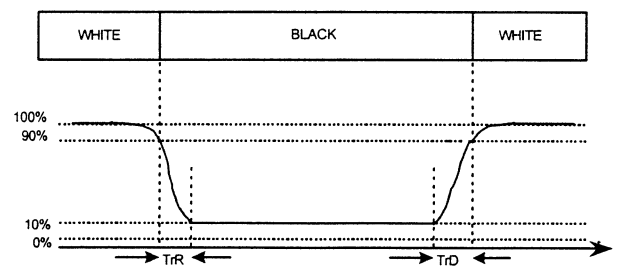
3.Contrast Ratio (CR) is defined mathematically as:

$$\frac{\text{Luminance in White Level (Max.)}}{\text{Luminance in Black Level (Min.)}}$$

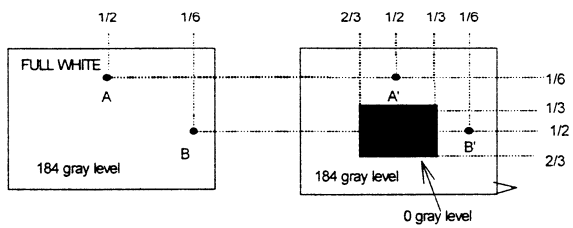
(at è = 0°, ó = 0°)

4. Response time

TrR measures the transition time of L1 relative luminance from white to black state, from 90% to 10% (see graph below)
TrD measures the transition time of L1 relative luminance from black to white state, from 10% to 90% (see graph below)



5. Cross talk shall be measured between two patterns.



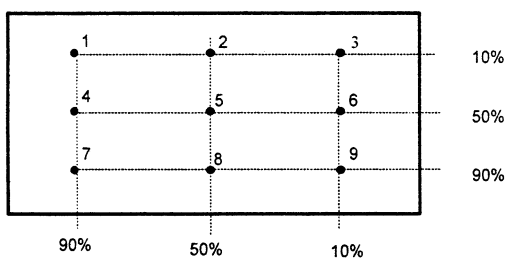
| LA - LA' | / LA x 100% = 1.2 % max.

| LB - LB' | / LB x 100% = 1.2 % max.

LA : Luminance of measured point in A (cd/m2)
LB : Luminance of measured point in B (cd/m2)
LA' : Luminance of measured point in A' (cd/m2)
LB' : Luminance of measured point in B' (cd/m2)

(at Viewing Angle $\theta = 0^{\circ}, \phi = 0^{\circ}$)

6. Brightness Uniformity of these 9 points is defined as below:



Brightness Uniformity = Min. brightness / Max. brightness x 100 %

3.9 BACK-LIGHT UNIT

The backlight system is an edge-lighting type with 2 CCFLs (Cold Cathode Fluorescent Tube).
The characters of dual lamps are shown in the following tables.

Ta=25 ± 2°C

ITEM	SYMBOL	MIN	TYP	MAX	Unit	Condition
Lamp Current	If	3.0	6.5	8.0	MA	For 1 CCFL
Lamp Voltage	VL		630	690	Vrms	For 1 CCFL
Driving Frequency		40	55	60	KHz	*1
LIFE		50.000	-	-	Hour	*2
Startup Voltage		1,300 TBD	-	-	Vrms	25± 2°C 0± 2°C

Note : **The waveform of the inverter output voltage must be area symmetric and the design of the inverter have specifications for the lamps.**

*1 Operating with out of range of specified CCFL driving frequency as above may affect brightness and uniformity of the product. Interference between Hsync frequency and CCFL driving frequency may feasibly cause Beat on the display.

*2 Criteria of lamp life shall be more than 50% of brightness.

4. Functional specification

All the tests to verify specifications in this section must be performed under the following standard conditions unless otherwise noted. The standard conditions are:
-Temperature : 5 to 40 degree Celsius
-AC line input voltage : 100 Vac to 240 Vac, 50Hz or 60Hz
-Warm-up time : 30 minutes minimum

4.1 Display Quality

4.1.1 Display Data Area (with full white pattern)
(1) Horizontal: 304.1 mm
(2) Vertical: 228.0 mm

4.1.2 Video Performance
(1) Resolution : 1024 X 768 pixels Maximum
(2) Contrast ratio : 250(Min.), 350(Typ.)
(3) Response time : 35 mS(Typ.)
(4)Viewing angle : Up:40° Down:60° R/L:60° (Min.) (At contrast ratio >= 10)
(5)CIE Coordinate: White (0.313, 0.329) +/- (0.03, 0.03)
(6) Display color: 24 bits color

4.1.3 Light Output
Brightness rating : 250cd/㎡ (Typ.)

4.1.4 Brightness Adjustment Range

At contrast ratio control set at maximum level, adjusting Brightness control from minimum to maximum position, the light output of WHITE pattern shall be increased more than 40cd/㎡.

5. Physical Specifications

5.1 Physical Dimension & Appearance

5.1.1 Overall Dimensions:
358mm (W) X 390mm (H) X 170mm (D)

5.1.2 Outer Appearance:
see Fig.1

5.2 Construction and Materials on outer surface
(1) Materials: Plastic
(2) Color: WHITE
To be defined for OEM

5.3 Base
(1) Tilt: 0/+25 °

5.4 Marking & Labels

5.4.1 Reference Label (Rear panel)
(1) Reference numbers
(2) Manufacture data
(3) Agency Approvals
(4) Power Ratings

5.4.2 Controls & Connectors
(1) AC power cord input: abbreviated labels
(2) User's Controls: standard print

5.5 Packaging

5.5.1 Carton Dimension:
446mm (W) X173mm (D) X 460mm (H) (LCD monitor)

5.5.2 Shipping Weight:
5.08kg (LCD monitor)

5.5.3 Shipping Container:
1500 sets per 40 feet container with pallet.

6. Maintainability Specifications

6.1 General & Requirements

6.1.1 Installation:
From outside of unit with standard tools and documentation provided to user.

6.1.2 Periodic Maintenance:
No periodic maintenance is required.

6.1.3 Repair & Calibration:
Require spare modules or components as specified as followings:
(1) Interface board ASSY
(2) AC-DC converter board ASSY
(2) Control board ASSY

6.2 Mean Time to Repair

6.2.1 Module Level:
Less than 10 minutes

6.2.2 Component Level:

Less than 15 minutes

6.3 Accessibility

6.3.1 General

All panels, covers, and major assemblies are removable without disruption of permanent mounting or fasteners.

6.3.2 Outside Cabinet, access to the following elements

-Operating Controls
-AC Inlet
-Audio in

6.3.3 Cover Removal, Access

All sub assemblies and internally adjustable components may be accessed by removing the base and the rear cover .

6.4 Equipment & Tools Required

6.4.1 Standard Test Equipment

(1) Voltmeter
(2) Dual trace oscilloscope
(3) Hand tools as required
(4) Computer with IBM VGA , or compatible graphic adapter

6.4.2 Documentation

A service manual will be available which covers all service requirements. A users manual written in Japanese, German, Italian, Spanish, France and English will be available to ship with the product.

6.5 Electrical Emission and Energy Saving summary for TCO99

6.5.1 Electrical Field (AC):

*Band I< 10V/m (132cd/m^2,"+" pattern)
*Band II< 1V/m (132cd/m^2,"+" pattern)

Note: Shielded power cord is not acceptable

6.5.2 Magnetic Field (AC):

*Band I< 200nt (132cd/m^2,"+" pattern)
*Band II< 32nt (132cd/m^2,"+" pattern)

Note: Shielded power cord is not acceptable

6.5.3 Energy Saving:

*1st stage: <15W(recover time:3 sec)
2nd stage: <5W
*single stage: <5W(recover time: 3sec)

Appendix 1 – Shipment Conditions

ITEM	State
Power	OFF
Brightness	90
Contrast	50
OSD-Image size	Full Screen
OSD-Language	English
OSD-Timeout	20s

Fig. 1 Physical Dimension Front View and Side view

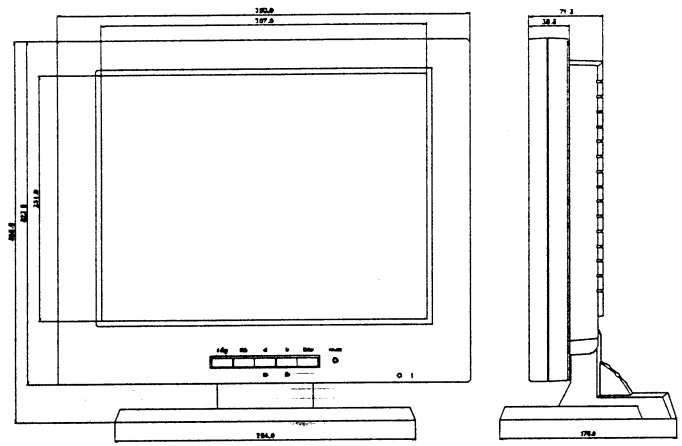


Table of Contents

I. INTRODUCTION: 2

II. BLOCK DIAGRAM 2

III. CIRCUIT OPERATION THEORY: 2

A-1.) INTERFACE BOARD DIAGRAM: 2

(a) Circuit operation theory: 3

(b) IC introduction: 3

A-2.) POWER BOARD DIAGRAM: 4

FIG.1 4

Fig. 2 4

Fig. 3 5

Fig. 4 5

Fig. 5 6

Fig. 6 6

Fig. 7 7

A-3.) CONTROL BOARD INTRODUCTION: 7

IV. INVERTER CIRCUIT OPERATION THEORY 7

1. BLOCK DIAGRAM 7

2. GENERAL SPECIFICATION 8

Output Requirement: 8

3.CIRCUIT OPERATION THEOREM 8

3.1 ON/OFF SWITCH 8

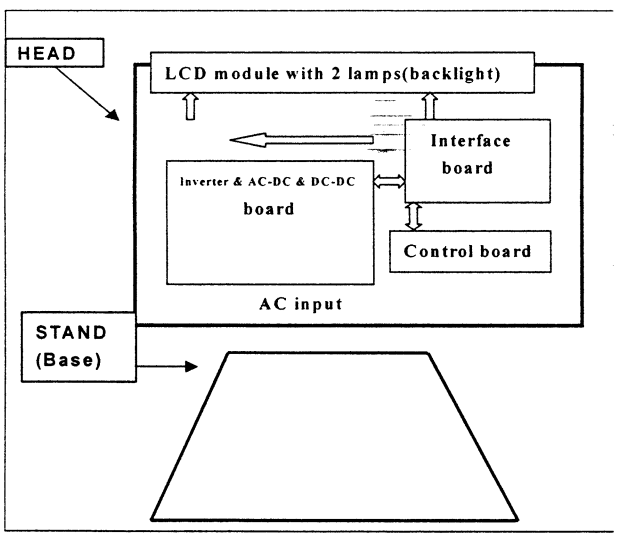
3.3 Oscillator Circuit 10

I. Introduction:

The FP553 is an 15" XGA (1024x768) 24 bits color TFT LCD monitor with multi-media function. It's an analog interface LCD monitor with an un-detachable 15 pins D-sub signal cable and it's compliant with VESA specification to offer a smart power management and power saving function. It also offers OSD menu for users to control the adjustable items and get some information about this monitor, and the best function is to offer users an easy method to set all adjustable items well just by pressing one key, we called it "i-key"(intelligent key) which can auto adjusting all controlled items.

II. Block diagram

The FP553 consists of a head and a stand (base). The head consists of a LCD module with 2 lamps, an Inverter & AC-DC board, a Control board and interface BD. The block diagram is shown as below.

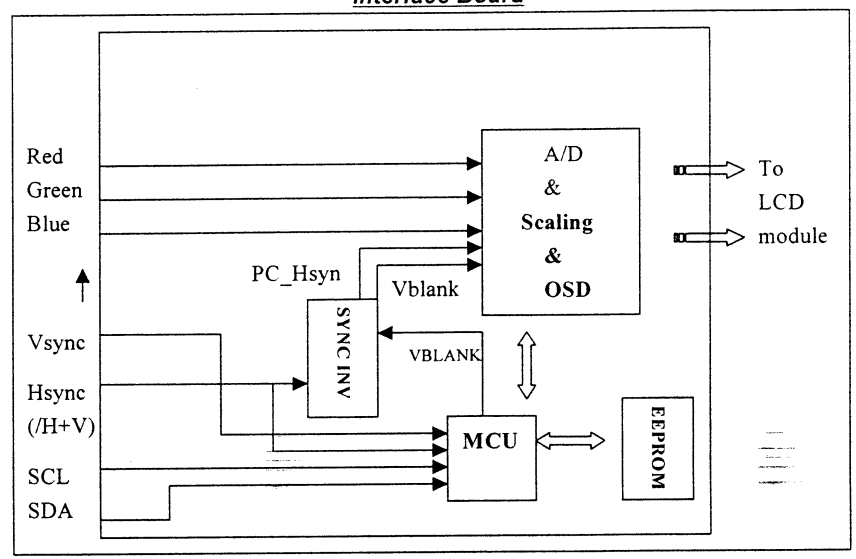


III. Circuit operation theory:

A.) HEAD:

A-1.) Interface board diagram:

Interface Board



(a) Circuit operation theory:

A basic operation theory for this interface board is to convert analog signals of Red, Green and Blue to digital signals of Red, Green and Blue. The scaling IC has internal A/D converter and internal OSD to process the analog input signals which are operating in the specification IC, finally the scaling IC output the digital RGB data, the Hsync, Vsync and pixel clock to LCD panel driver.

(b) IC introduction:

1.) DDC (Display Data Channel) IC: We use MYSON MTV212 to support DDC1/2B function, It will store DDC data to 24C04 and read DDC data from 24C04 then put those data to RAM of MTV212. Those data related to LCD monitor and PC can read them by "Vsync and SDA" serial communication for DDC1 or I^2C communication for DDC2B.

2.) Sync Inverter: we use to tune the PC-Hsync and the PC-Vsync from PC.

3.) Scaling IC: We use Zan1 of Genesis .The Zan1 is revolutionary scaling engine, capable of expanding any source resolution to a highly uniform and sharp image, combined with the critically proven integrated 8 bit triple-ADC and patented Rapid-lock digital clock recovery system. It also support detect mode and DPMS control.

4.) MCU: We use MTV212 control unit, it controls all the functions of this interface board, just like the OSD display setting, the adjustable items, adjusted data storage, the external RS232 communication, support DDC1/DDC2B.

5.) EEPROM: We use 24C04 to store all the adjustable data except zoom on/off control, and we divided it into two parts for the storage of DDC data and user settings.

A-2.) Power board diagram:

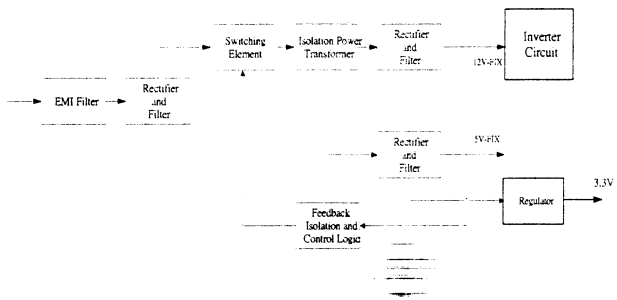


Fig.1

#1 EMI Filter

This circuit (fig. 2) is designed to inhibit electrical and magnetic interference for meeting FCC, VDE, VCCI standard requirements.

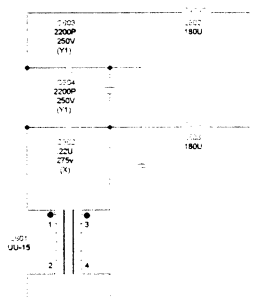


Fig. 2

#2 Rectifier and filter

AC Voltage (90-264V) is rectified and filtered by BD601, C605 (See Fig 3) and the DC Output voltage is 1.4*(AC input). (See Fig.3)

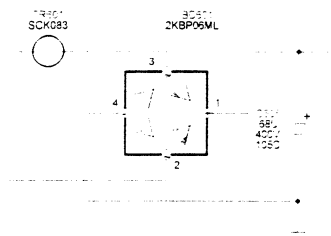


Fig. 3

#3 Switching element and Isolation power transformer

When the Q601 turns on, energy is stored in the transformer. During Q601 turn-off period, the stored energy is delivered to the secondary of transformer. R607, C607 and D601 is a snubber circuit. R615 is current sense resistor to control output power. (See Fig.4)

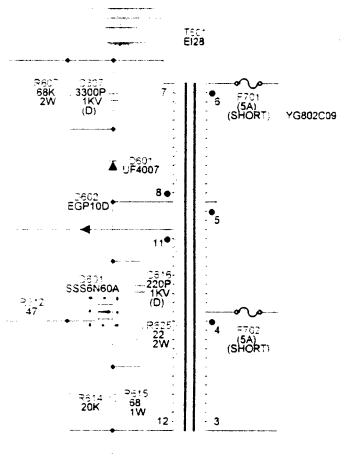


Fig. 4

#4 Rectifier and filter

D702 and C707 are to produce DC output. L702 and C708 are to suppress high Frequency switching spikes. R704 is a dummy load. (See Fig.5)

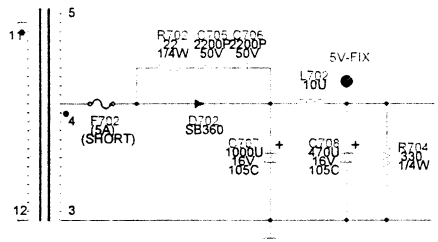


Fig. 5

#5 Control circuit

The current mode control IC UC3842B is used to control PWM. When the VCC terminal of it gets 16V, IC601 turns on. +5V will be set up at Pin8 through soft start circuit, which includes R617, C611, D606 and D605. R616 and C610 generate a fixed frequency saw-tooth wave at Pin4.

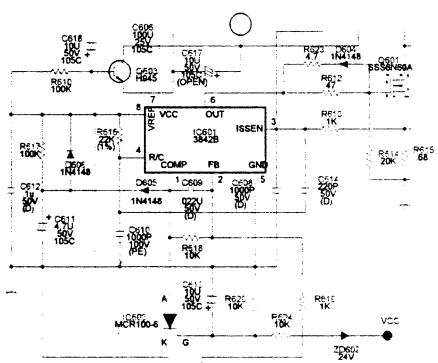


Fig. 6

#6 Feedback circuit

PC123 is a photo-coupler and TL431 is a shunt regulation. They are used to detect the output voltage change and be the primary and secondary isolation. When output voltage changes, the feedback voltage will be compared and duty cycle will be decided to control the correct output voltage. (See Fig.7)

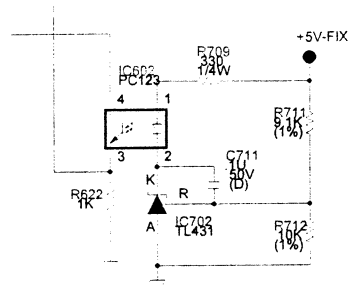


Fig. 7

A-3.) Control board introduction:

The main parts of the control board are a push button, an encoder and a led.

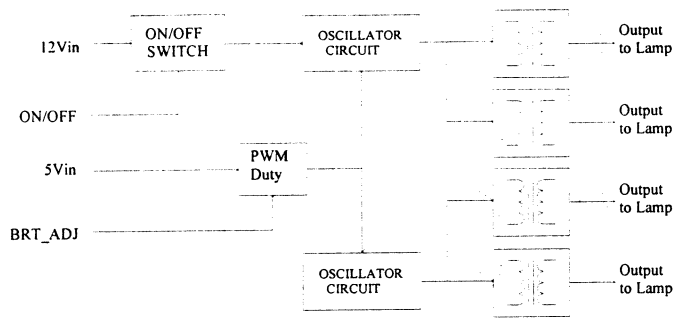
(a) **Push button:** It's a simple switch function, pressing it for "ON" to do the auto adjustment function, releasing it for "OFF" to do nothing.

(b) **Encoder:** It supports two functions, one is for wheel adjustment which can be controlled in clockwise direction and counterclockwise direction, and the other is for push button function. When we rotate the wheel, it will output the specific pulse to help us to know its operating direction.

© **Led:** It indicates the DPMS status of this LCD monitor, green light means DPMS on (Normal operating condition). Amber light means DPMS off (Power off condition).

IV. Inverter Circuit Operation Theory

1. Block Diagram



2. General Specification

Input Voltage :12V and 5V

Input Current :1.5A max.

ON/OFF Voltage :5V/0V

PWM Duty : 5V/47KHz

Output Requirement:

Max. Output Current :12mA

Min. Output Current :6mA

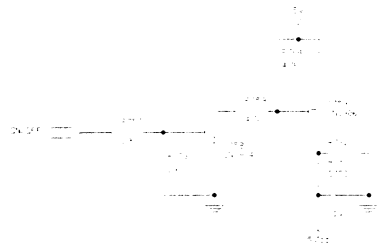
Lamp Working Voltage :600Vrms

Open Lamp Voltage :1000Vrms

Frequency :47KHz

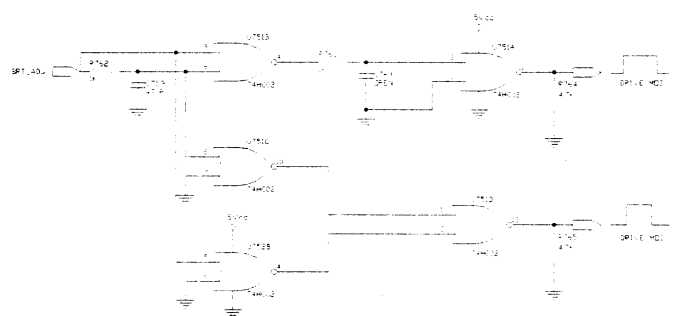
3.Circuit Operation Theorem

3.1 ON/OFF SWITCH



The turn-on voltage was controlled by R757 and R758.The inverter was turned on or off by the switching transistors Q758 and Q759.The resistors R759 and R760 shall be supplied enough voltage and current for Q758 and Q759.

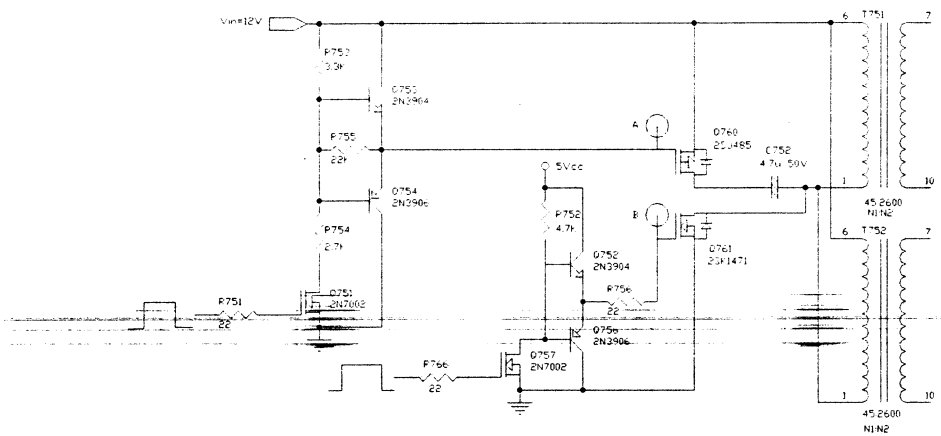
3.2 PWM Duty

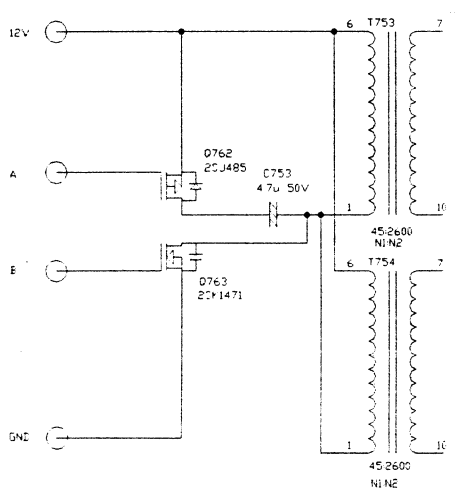


R762 ، R763 ، C759 and C760 made pulse wave delay.U751 and U752 are quad 2-input nor gate ، and surport

Pulse Width Modulation(PWM) to drive one paire of N-and P-power MOSFET switches.

3.3 Oscillator Circuit





The totem poles circuit can improve a capable of driving for Q760,Q761,Q762,Q763.
This circuit has two , one totem pole is combined by Q753,Q754,R753,R754,and R755 .

The other totem pole is combined by Q752,Q756,and R752 . The oscillator circuit is a PWM push-pull manner . Q761, Q763 are capable of driving standard power N-MOSFET switches ,
Q760, Q762 are capable of driving standard power P-MOSFET switches . These N- and P-MOSFET switches operate in a complementary Duty-Cycle mode . In other words , N- power MOSFET is turned on after P- power MOSFET is turned off , and these two switches never be turned on simultaneously . Note that during the positive half-cycle , the input current is the sum of the magnetizing and reflected output currents , Is*N2/N1 . During the negative half-cycle , the ,magnetizing current essentially supports all the output current . In effect , the transformer transfers energy to the secondary side with the same coupled-inductor characteristics as a "flyback" DC-DC converter .

Alignment procedure (for function adjustment)

1. Enter factory area (press "enter" & "exit" & "power on")
2. Setting burn in mode on.
3. Select timing, which has star sign have to adjust. (See figure 1)
4. Press I-key to adjust the image.
5. Clear user area. (In recall mode press "yes")
6. Turn on power enter user area.

Figure 1.

Resolution	Horizontal Frequency (KHz)	Vertical Frequency (Hz)	Dot Clock Frequency (MHz)	Remark
* 640x350	31.47(P)	70.08(N)	25.17	DOS
* 720x400	31.47(N)	70.08(P)	28.32	DOS
* 640x480	31.47(N)	60.00(N)	25.18	DOS
* 640X480	37.86(N)	72.80(N)	31.5	VESA
* 640X480	37.50(N)	75.00(N)	31.5	VESA
*800x600	35.16(P)	56.25(P)	36.00	VESA
*800x600	37.88(P)	60.32(P)	40.00	VESA
*800x600	48.08(P)	72.19(P)	50.00	VESA
* 800X600	46.87(P)	75.00(P)	49.5	VESA
* 1024x768	48.36(N)	60.00(N)	65.00	VESA
* 1024x768	56.48(N)	70.10(N)	75.00	VESA
* 1024x768	60.02(P)	75.00(P)	78.75	VESA

* Factory preset timings

Shipment Conditions :

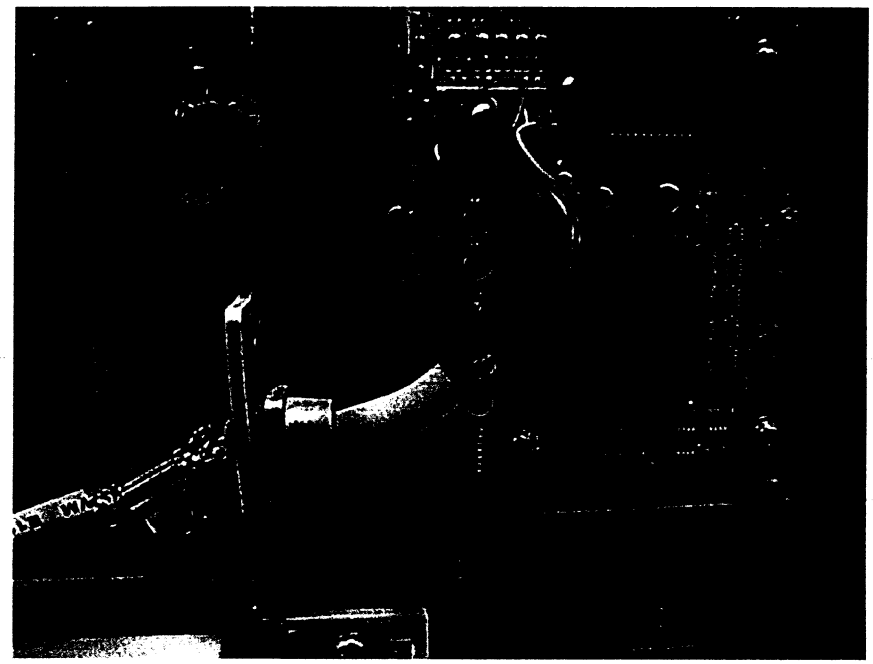
Reference Engineering Specification – Appendix1

FP553 LCD Monitor Service Guide

Chapter3 Alignment Procedure

Wire dressing:

Below pictures are for reference, please refer to the FP553X1 for the additional wire dressings.

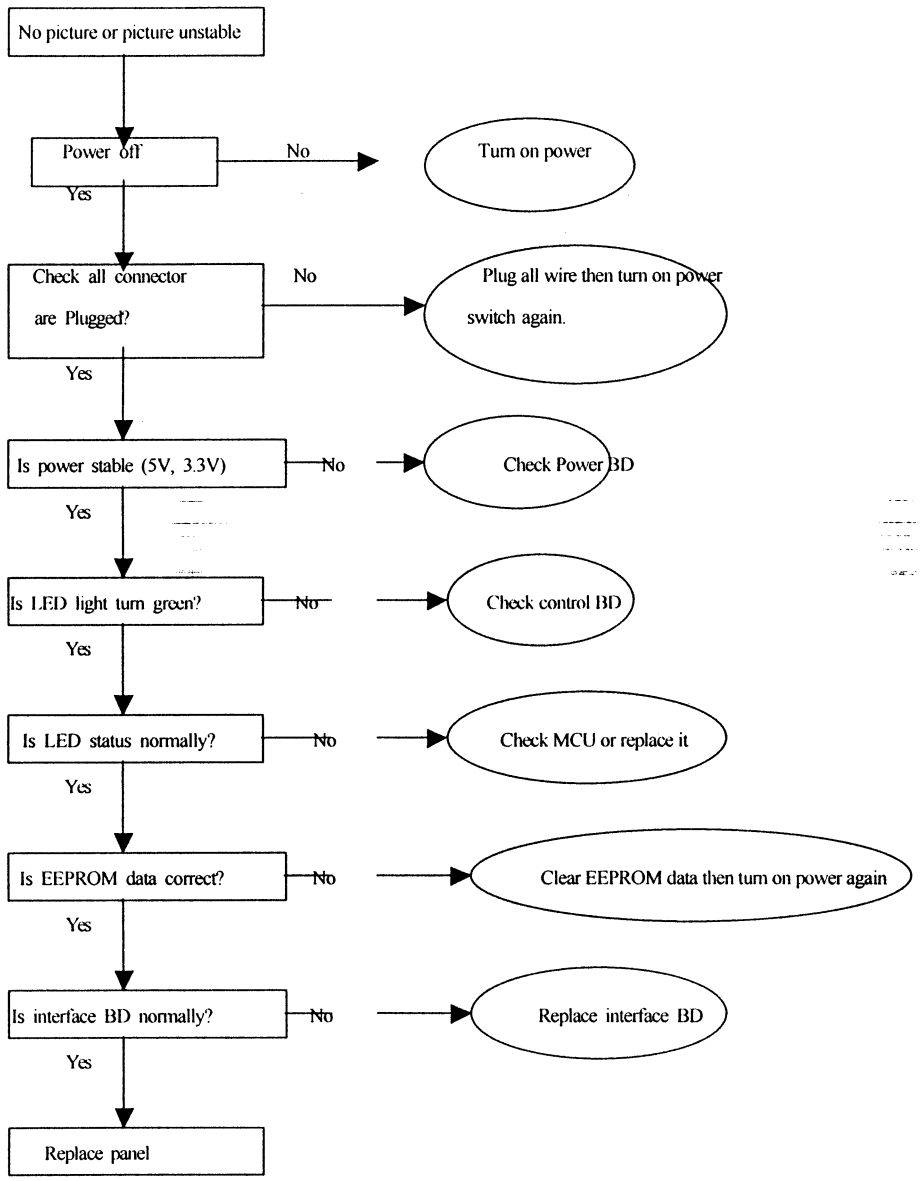


Form No: 704-C13-02 (000715) ACM's Confidence and Property

Table of Contents

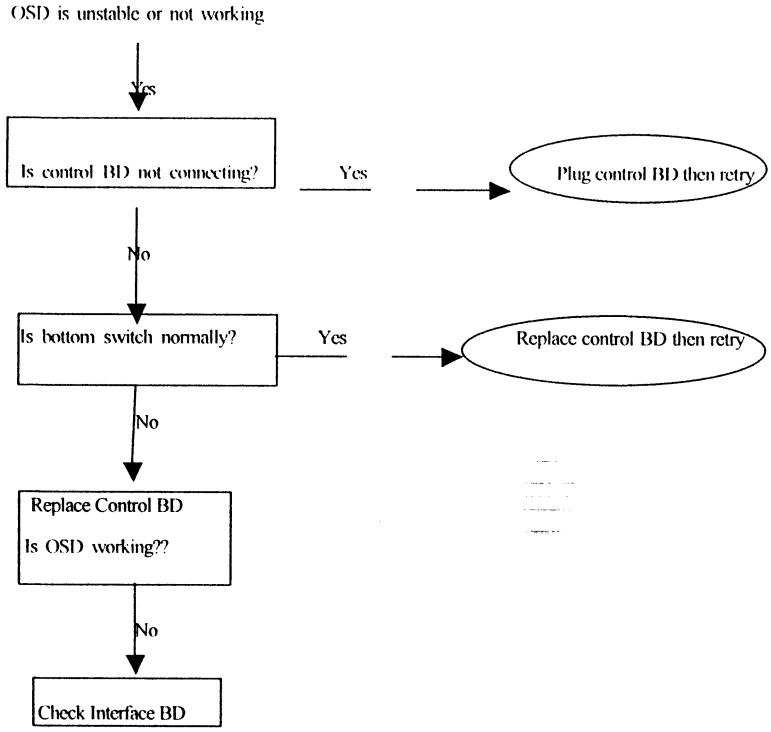
1. No Picture or Picture is unstable:

1.1 Interface Board:

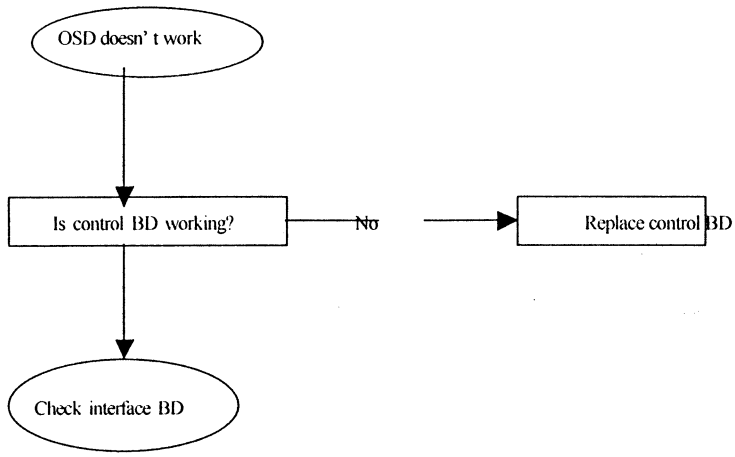


2. BUTTON function:

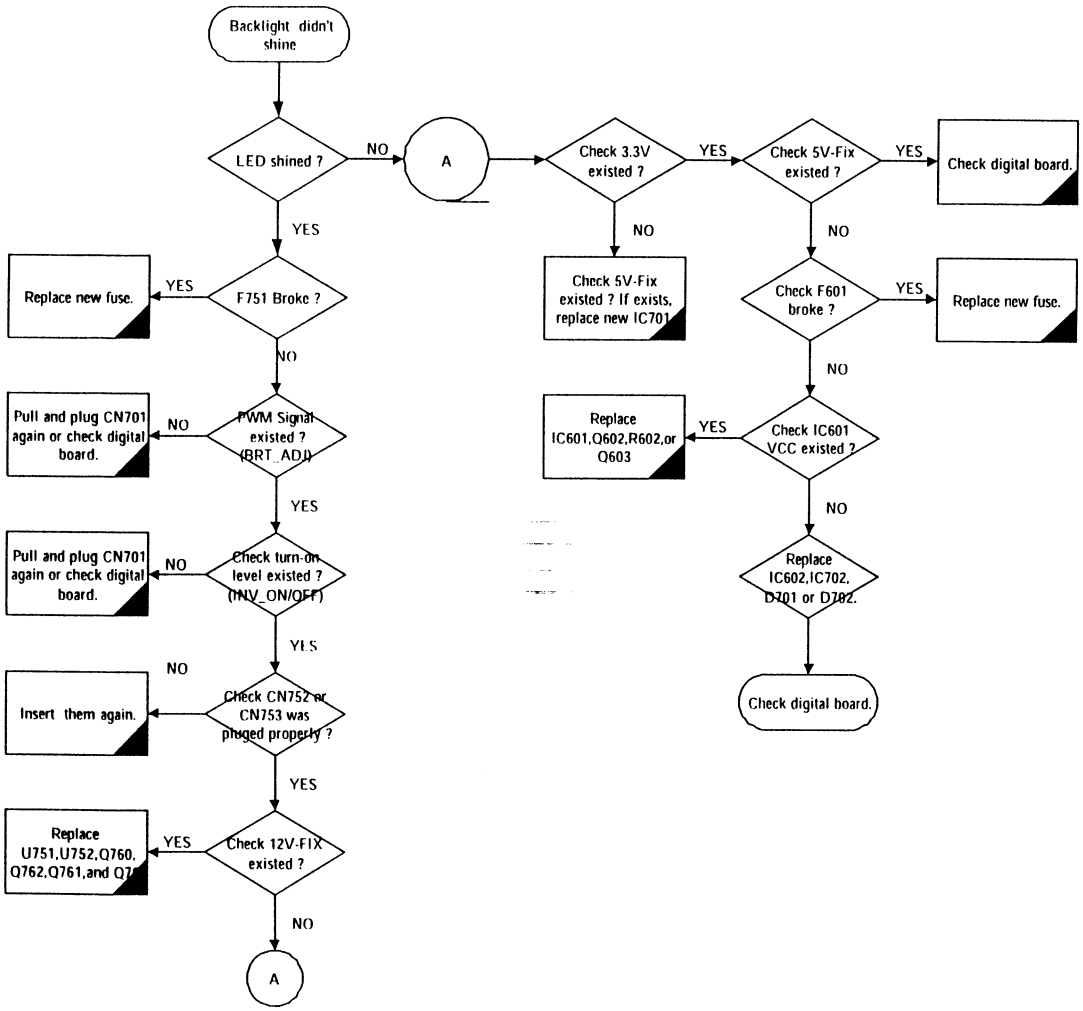
2.1 Control Board

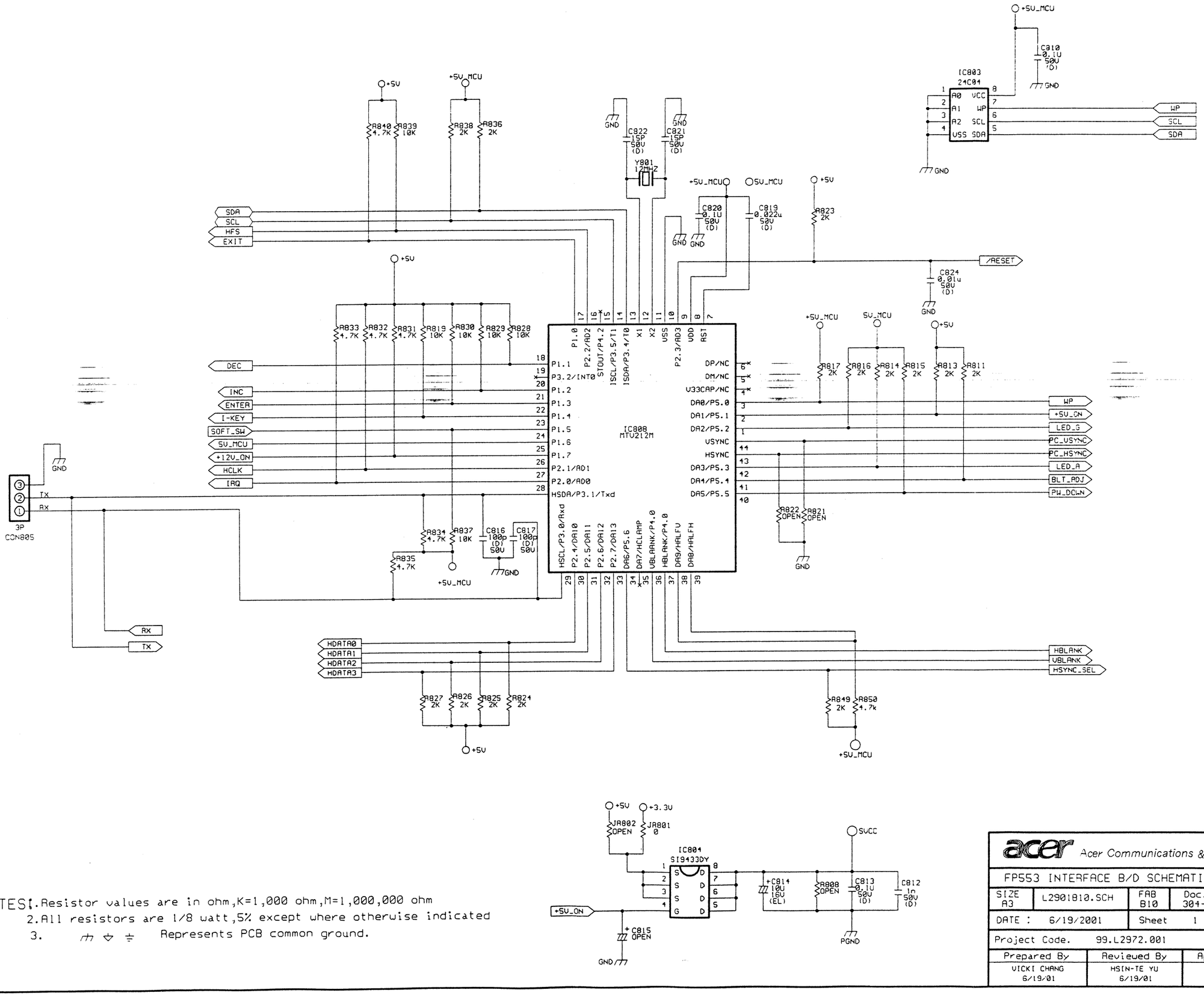


3. OSD function:



4. Power Board

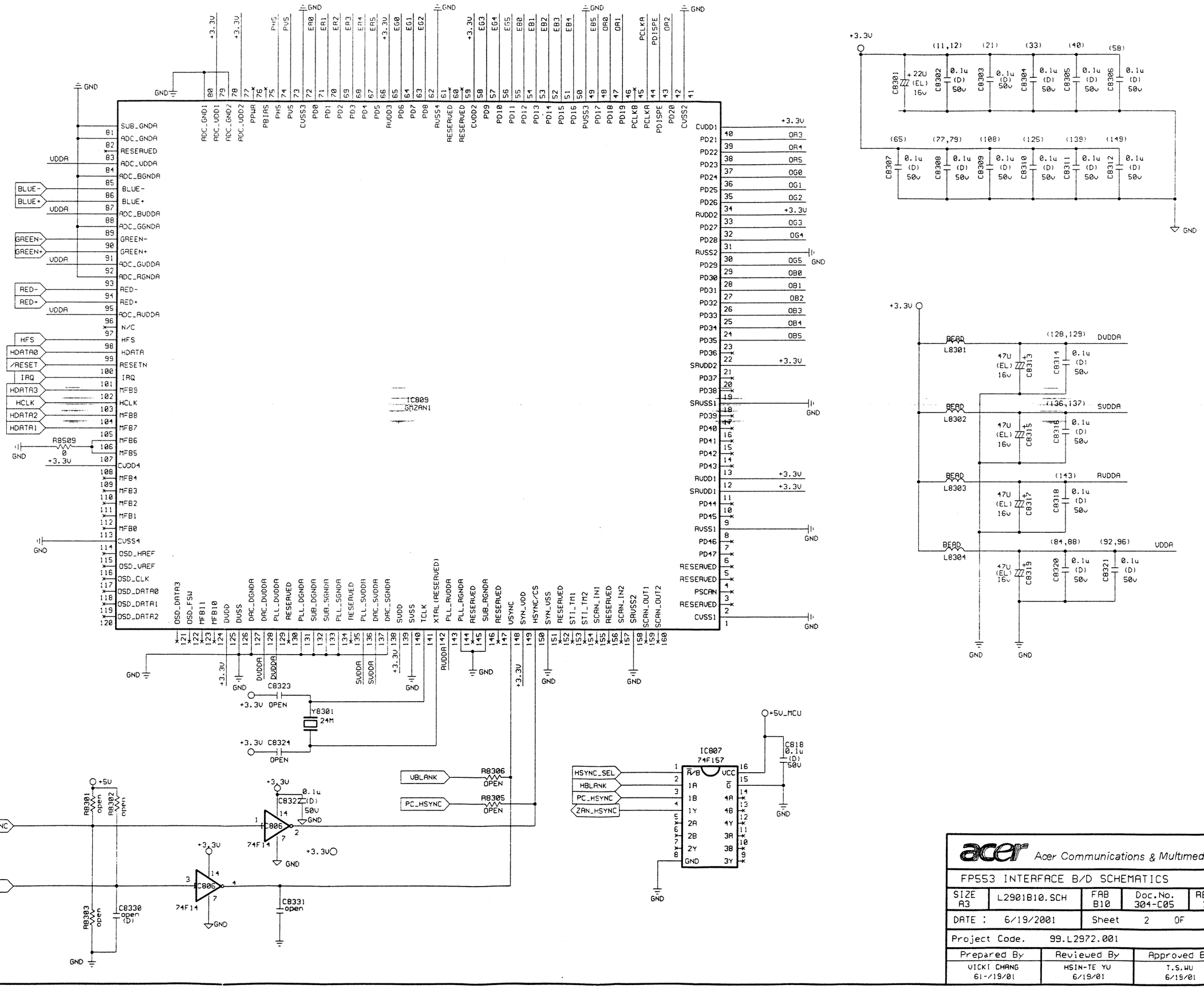




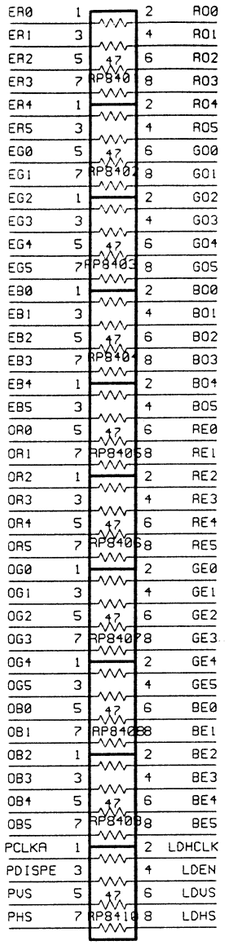
NOTES: 1. Resistor values are in ohm, K=1,000 ohm, M=1,000,000 ohm
2. All resistors are 1/8 watt, 5% except where otherwise indicated
3. ⏚ ⏚ ⏚ Represents PCB common ground.

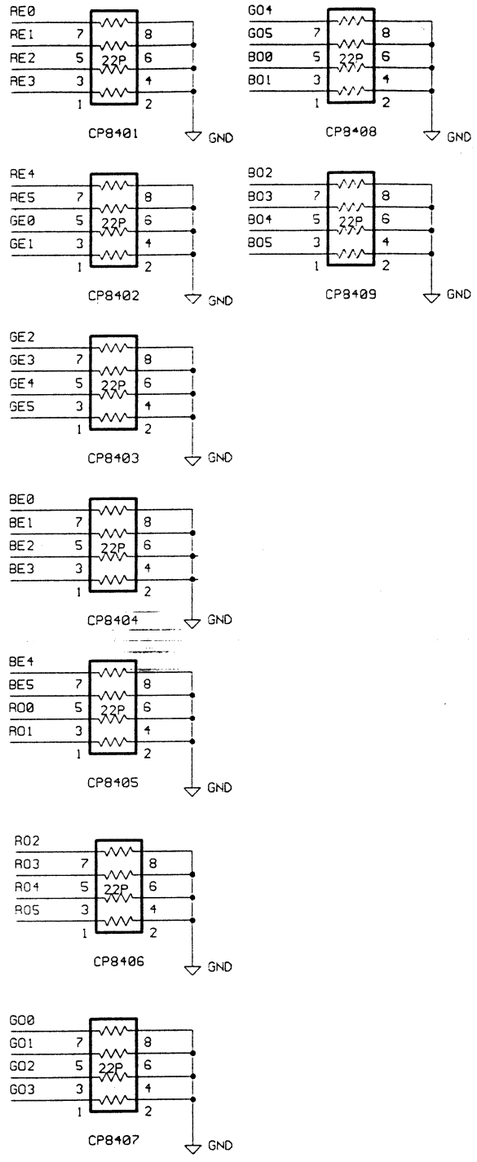
Acer Communications & Multimedia

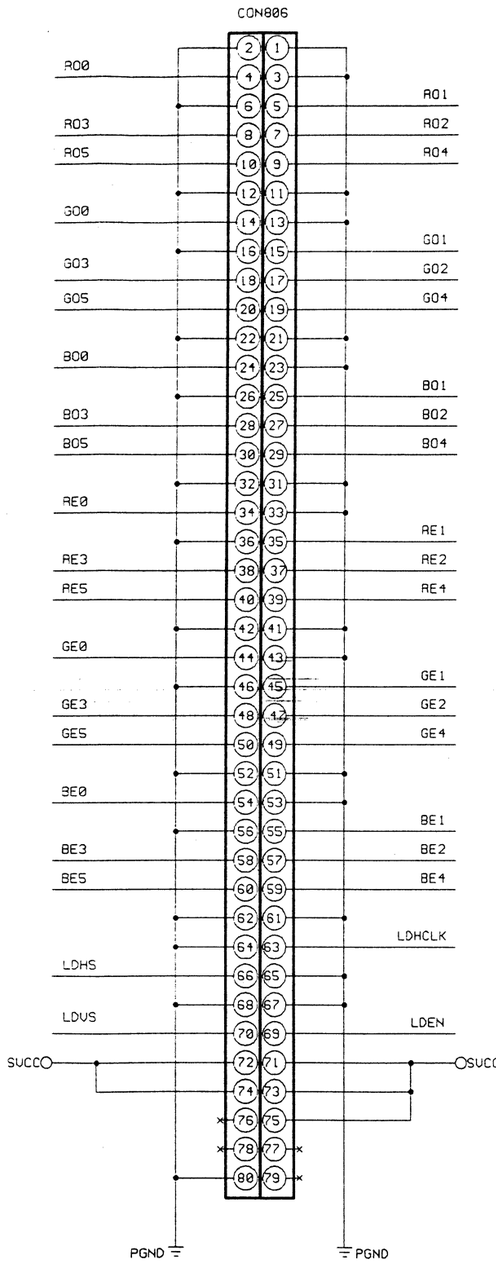
FP553 INTERFACE B/D SCHEMATICS				
SIZE A3	L2901B10.SCH	FAB B10	Doc. No. 304-C05	REV. 1
DATE : 6/19/2001		Sheet 1 OF 5		
Project Code. 99.L2972.001				
Prepared By	Reviewed By	Approved By		
VICKI CHANG 6/19/01	HSIN-TE YU 6/19/01	T.S.WU 6/19/01		



acer Acer Communications & Multimedia			
FP553 INTERFACE B/D SCHEMATICS			
SIZE A3	L2901B10.SCH	FAB B10	Doc.No. 304-C05 REV. 1
DATE : 6/19/2001		Sheet 2 OF 5	
Project Code. 99.L2972.001			
Prepared By	Reviewed By	Approved By	
VICKI CHANG 6/-/19/01	HSIN-TE YU 6/19/01	T.S.WU 6/19/01	




RE0 RE1 RE2 RE3 22P CP8401 GND
GO4 GO5 BO0 BO1 22P CP8408 GND
RE4 RE5 GE0 GE1 22P CP8402 GND
BO2 BO3 BO4 BO5 22P CP8409 GND
GE2 GE3 GE4 GE5 22P CP8403 GND
BE0 BE1 BE2 BE3 22P CP8404 GND
BE4 BE5 RO0 RO1 22P CP8405 GND
RO2 RO3 RO4 RO5 22P CP8406 GND
GO0 GO1 GO2 GO3 22P CP8407 GND



NOTES: 1. Resistor values are in ohm, K=1,000 ohm, M=1,000,000 ohm
2. All resistors are 1/8 watt, 5% except where otherwise indicated

0.00 Represents PCB common ground.

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FP553 INTERFACE B/D SCHEMATICS				
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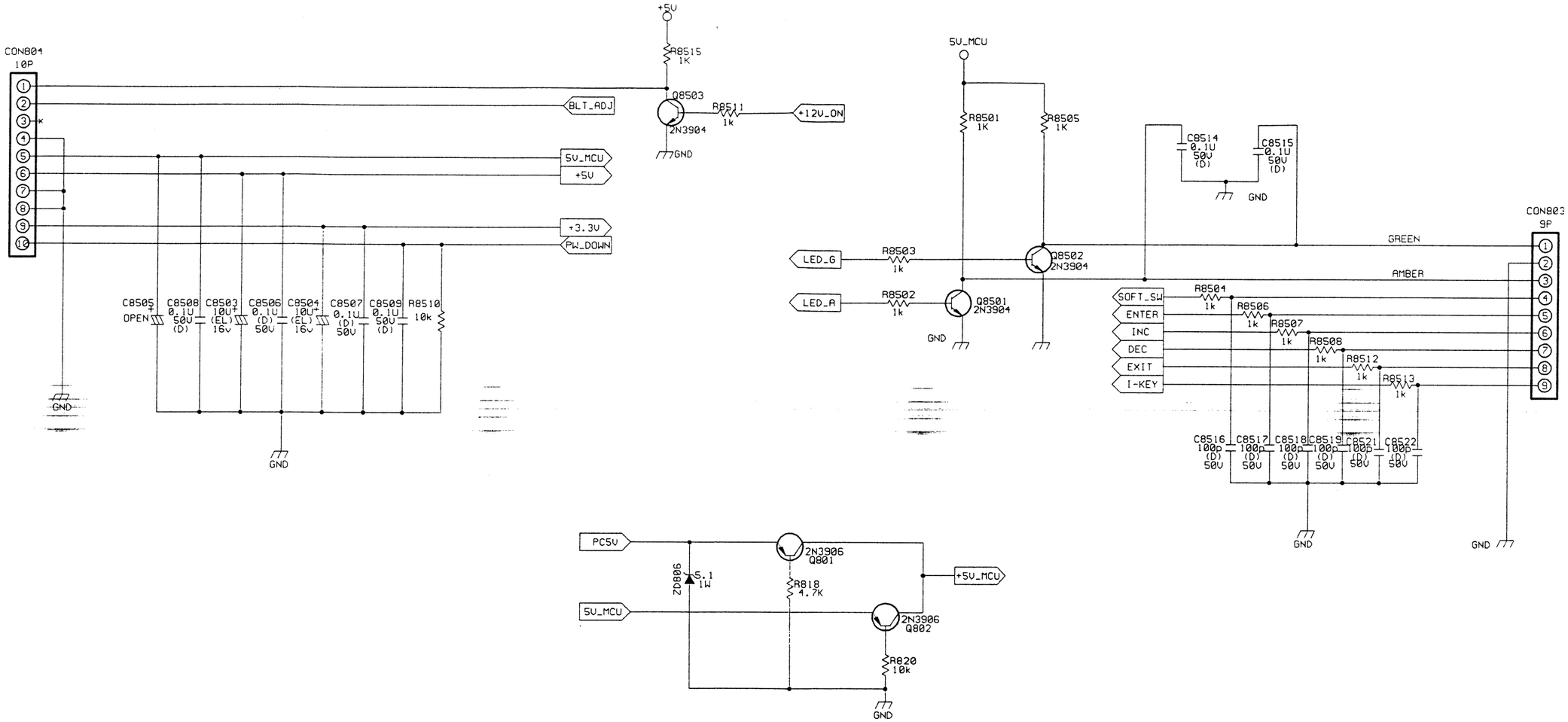
DATE : 6/19/2001		Sheet 3 OF 5		
Project Code. 99.L2972.001				
Prepared By	Reviewed By	Approved By		
VICKI CHANG 6/19/01	HSIN-TE YU 6/19/01	T.S.WU 6/19/01		



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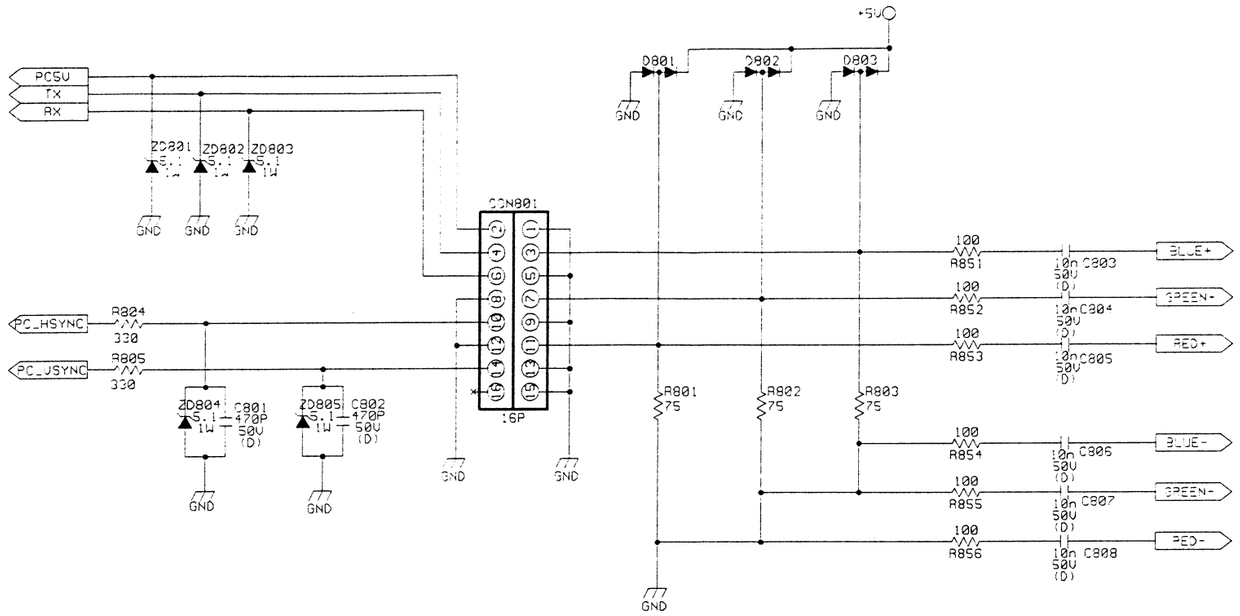
0.00 Represents PCB common ground.

acer Acer Communications & Multimedia				
FP553 INTERFACE B/D SCHEMATICS				
SIZE A3	L2901B10.SCH	FAB B10	Doc. No. 304-C05	REV. 1
DATE : 6/19/2001		Sheet 4 OF 5		
Project Code. 99.L2972.001				
Prepared By	Reviewed By	Approved By		
VICKI CHANG 6/19/01	HSIN-TE YU 6/19/01	T.S.WU 6/19/01		



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2. All resistors are 1/8 watt, 5% except where otherwise indicated
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FP553 INTERFACE B/D SCHEMATICS

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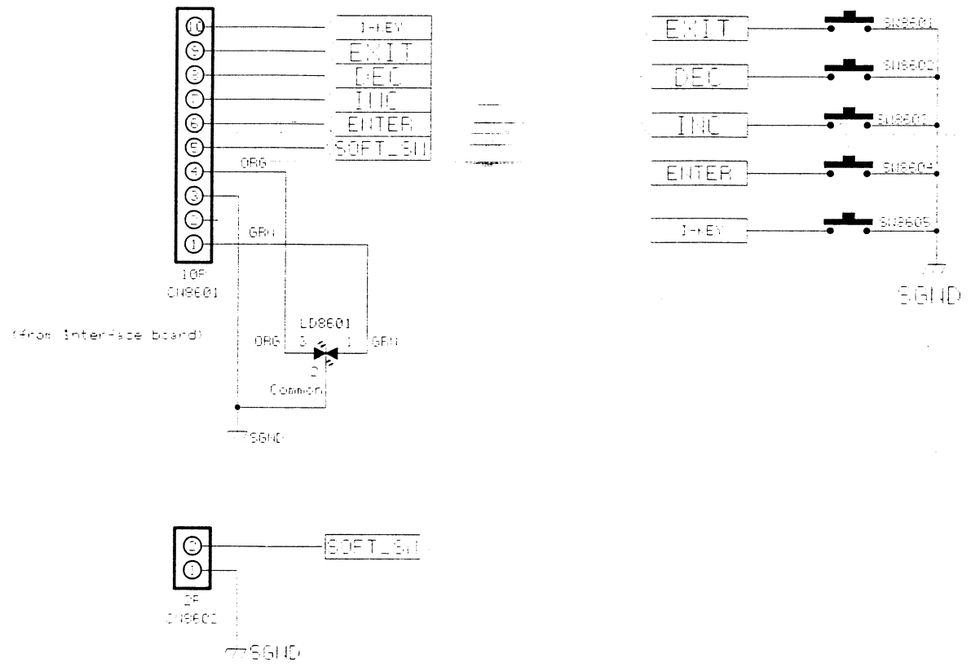
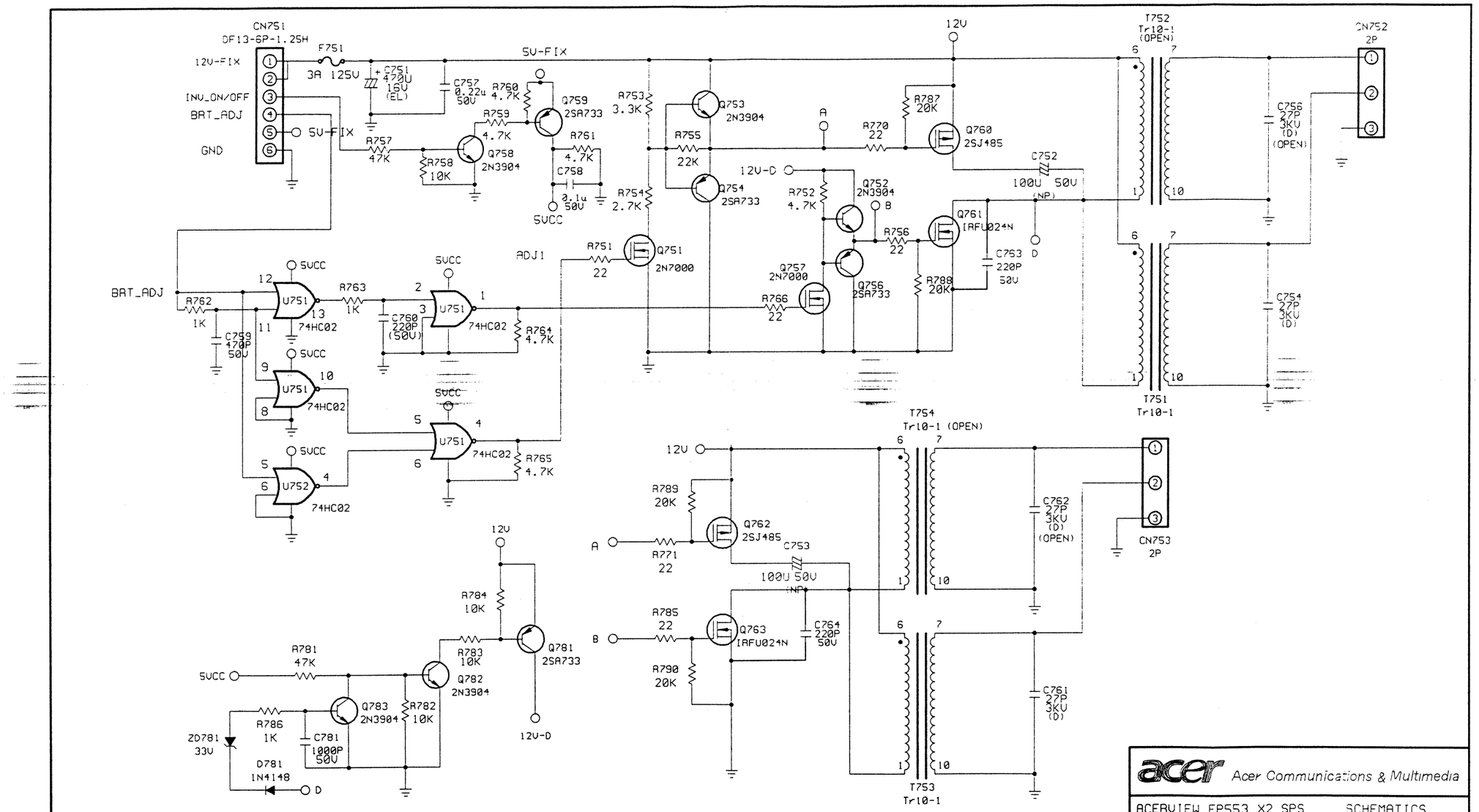
DATE : 6/19/2001		Sheet 5 OF 5		
Project Code. 99.L2972.001				

Prepared By	Revieued By	Approved By
VICKI CHANG 6/19/01	HSIN-TE YU 6/19/01	T.S.WU 6/19/01



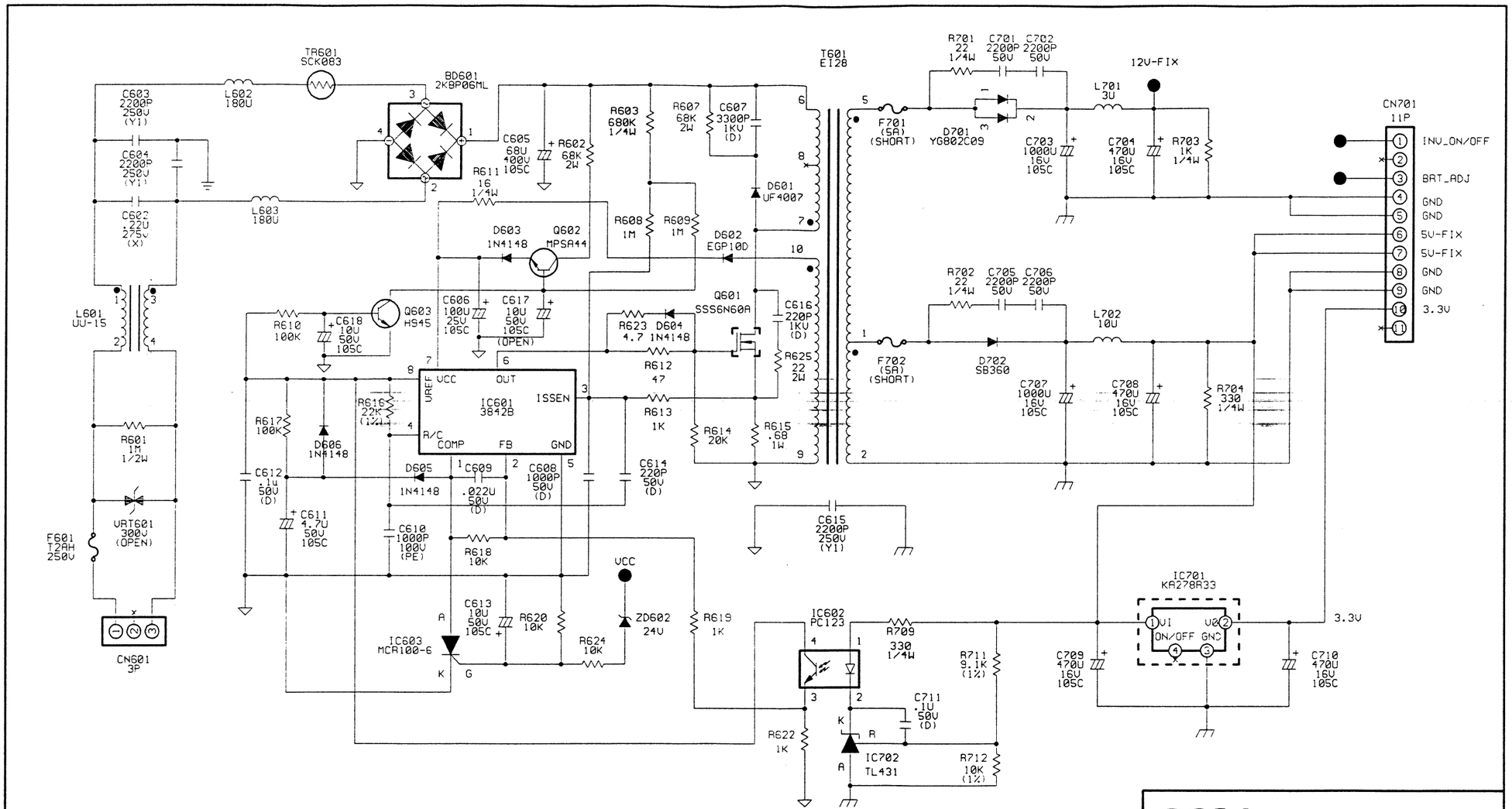
NOTE:1.Resistor values are in ohm(s) 000 ohm (s) 000,000 ohm
2.All resistors are 1/8 watt,5% except where otherwise indicated
3. ⏚ ⏚ ⏚ Represents PCB common ground.

Acer Communications & Multimedia Inc.				
FPFP CONTROL BOARD SCHEMATICS				
SIZE A4	L9601A04.SCH	FAB A04	Doc.No. 304-002	REV. 1
DATE : 4/1/2001		Sheet 1 OF 1		
Project Code. 88.L96P1.001				
Prepared By	Reviewed By	Approved By		
[illegible] CHANG 4/1/01	[illegible] 4/1/01	T.S.Wu 4/1/01		



NOTES: 1. Resistor values are in ohm, K=1,000 ohm, M=1,000,000 ohm
2. All resistors are SMD 0805, 5% except where otherwise indicated
3. ⏚ ⏚ ⏚ Represents PCB common ground.

Acer Communications & Multimedia				
ACERVIEW FP553 X2 SPS SCHEMATICS				
SIZE A4	L2903B10.SCH	FAB B10	Doc.No. 304-C04	REV. 1
DATE : 6/19/2001		Sheet 1 OF 2		
Project Code. 99.L2972.001				
Prepared By	Reviewed By	Approved By		
VICKI CHANG 6/19/01	HSIN-TE YU 6/19/01	T.S.WU 6/19/01		



NOTES:
1. Resistor values are in ohm, K=1,000 ohm, M=1,000,000 ohm
2. All resistors are SMD 0805, 5% except where otherwise indicated
3. ⏚ ⏚ ⏚ Represents PCB common ground.

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ACERVIEW FP553 SPS SCHEMATICS				
SIZE A4	L2903B10.SCH	FAB B10	Doc.No. 304-C04	REV. 1
DATE : 6/19/2001		Sheet 2 OF 2		
Project Code. 99.L2972.001				
Prepared By	Reviewed By	Approved By		
VICKI CHANG 6/19/01	HSIN-TE YU 6/19/01	T.S.WU 6/19/01		

ITEM	PART NUMBER	DESCRIPTION	Q'TY
1	60.L2912.XXX	BZL ABS HB FP553/ACER	1
2	60.L2908.001	ASSY SW+WIRE FP553	1
3	55.L2902.001	CONTROL BD	1
4	56.91L33.001	ADT-X2 LCD PANEL	1
5	60.L2914.XXX	BKT-PNL SECC 0.8 FP553 X2/ACER	1
6	55.L2903.002	POWER B/D	1
7	42.75M07.XXX	CVR U/C ABS HB 002 FP553	1
8	55.L2901.002	INTERFACE BD	1
9	50.L2902.XXX	SIGNAL CABLE FP553	1
10	33.L2902.XXX	SHD-PNL SPTC 0.3 FP553	1
11	60.L2906.XXX	ASSY BASE ABS HB FP553	1
12	39.L2901.XXX	U/C ABS HB 002 FP553	1
13	86.1A523.100	SCRW MACH PAN M4*0.7*10L C-ZN	4
14	86.1A523.4R0	SCRW TAP PAN M2.5*4L NI	2
15	86.VG434.6R0	SCRW TAP PAN F/WSH M3*6L C-ZN	11
16	86.5A524.8R0	SCREW MACH FLAT M3*12L NI	2
17	86.WA314.8R0	SCRW TAP CAP M3*1.34P*8L	11
18	86.00075.100	SCRW NYLOK M4*100	4
19	86.XA514.120	SCRW TAP FLAT M3*1.34P*12L NI	4
20	86.00010.161	SCRW TAPTILE TRS W/EXT M4*8L	1
21	38.04054.071	TAPE ADHESIVE 35*25 BLK 7651F	2
22	31.75M01.021	PLT GND CTRL B/D PBR FP550	2
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24			
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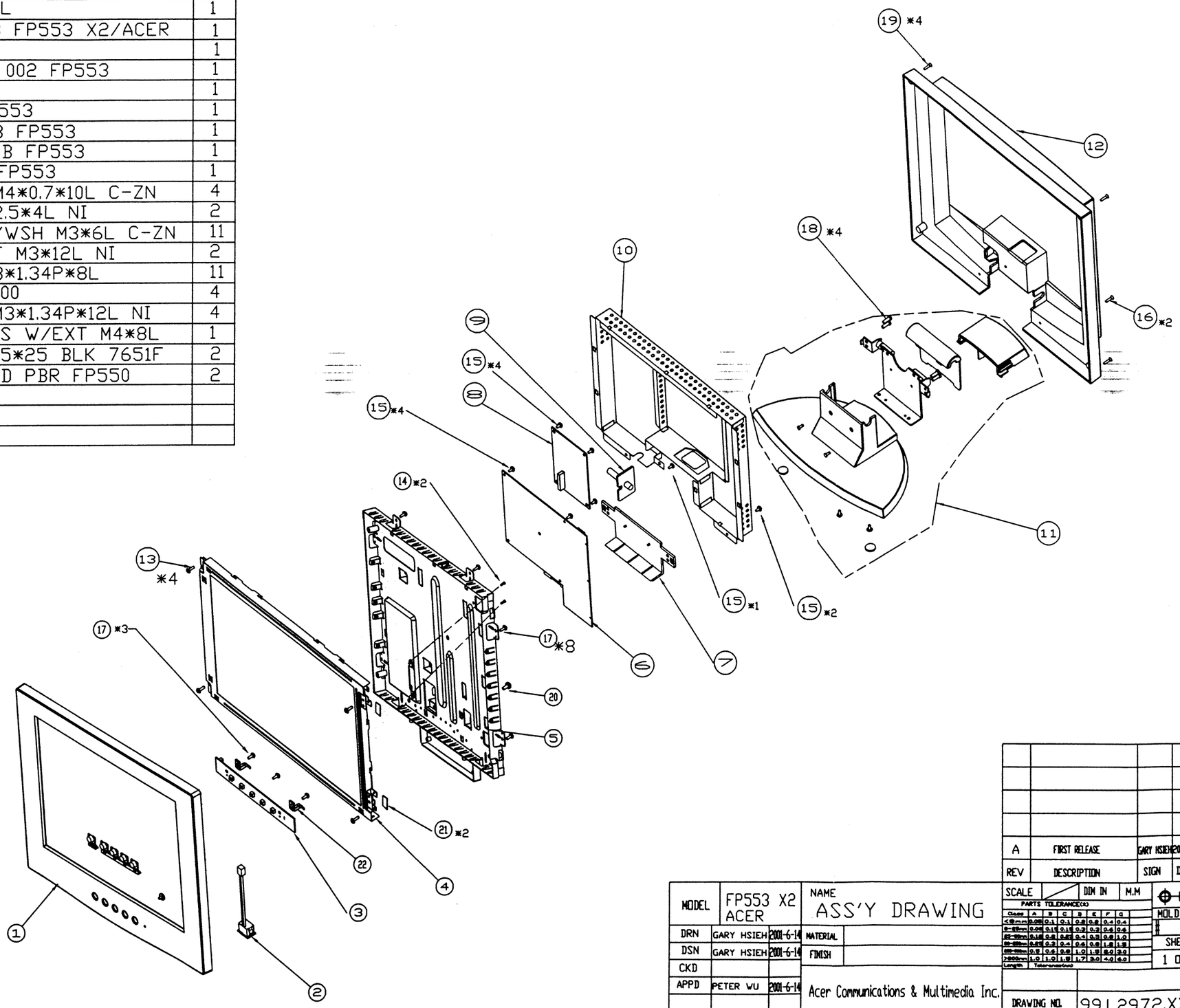

REV	DESCRIPTION	SIGN	DATE
A	FIRST RELEASE	GARY HSIEH	2001-6-14

MODEL	FP553 X2 ACER	NAME	ASS'Y DRAWING
DRN	GARY HSIEH 2001-6-14	MATERIAL	
DSN	GARY HSIEH 2001-6-14	FINISH	
CKD			
APPD	PETER WU 2001-6-14	Acer Communications & Multimedia Inc.	
		DRAWING NO.	99.L2972.XXX

SCALE | DIM IN | M.M

PARTS TOLERANCE(±)

Class	A	B	C	D	E	F	G
<6mm	0.05	0.1	0.1	0.2	0.2	0.4	0.4
6~30mm	0.05	0.1	0.1	0.2	0.2	0.4	0.4
30~120mm	0.1	0.2	0.2	0.4	0.2	0.8	1.0
120~315mm	0.15	0.2	0.4	0.6	0.8	1.2	1.2
315~1000mm	0.2	0.4	0.6	0.8	1.0	1.2	2.0
>1000mm	1.0	1.0	1.2	1.2	3.0	4.0	6.0
Length	Tolerance(mm)						

MOLD NO.

SHEET 1 OF 1